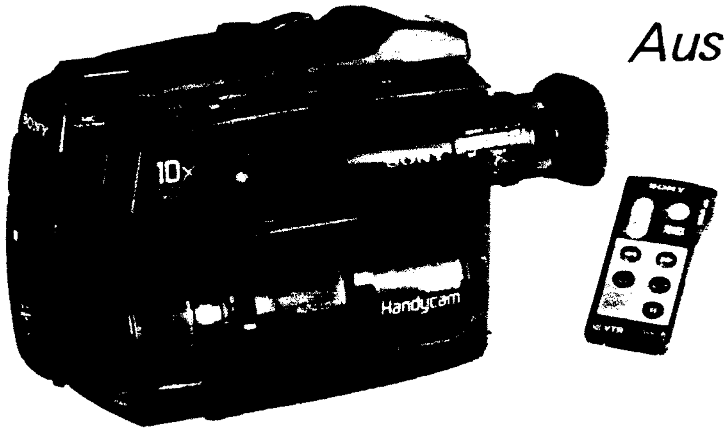
CCD-TR60E
RMT-504

SERVICE MANUAL

AEP Model
UK Model
Australian Model
E Model



Video 8
Handycam
U MECHANISM

For MECHANISM ADJUSTMENTS, refer to the "8 mm Video MECHANICAL ADJUSTMENT MANUAL Ⅲ" (9-972-732-11).

SPECIFICATIONS

System

Video recording system	Rotary two heads, Helical scanning FM system
Audio recording system	Rotary head, FM system
Video signal	PAL colour, CCIR standards
Usable cassette	8 mm video format cassette
Tape speed	SP mode: Approx. 20.051 mm/second. LP mode: Approx. 10.058 mm/second
Recording time	SP mode: 1 hour and 30 minutes (P5-90) LP mode: 3 hours (P5-90)
Playback time	SP mode: 1 hour and 30 minutes (P5-90) LP mode: 3 hours (P5-90)
Fast-forward/rewind time	Approx. 6.5 min. (P5-90)
Image device	CCD (Charge Coupled Device)
Viewfinder	Electronic viewfinder (black and white)
Lens	Combined 10 × power zoom lens f = 6.2 to 62 mm (1/4 to 2 15/32 inches) F 1.8 Filter diameter: 37 mm (1 1/2 inches)
Auto focus system	TTL
Colour temperature	Automatic, HOLD, ☼ (indoor) 3200K, ☀ (outdoor) 5,800K
Minimum illumination	4 lux (F 1.8)
Illumination range	4 lux – 100.000 lux (0.4 – 9,290 footcandles)
Recommended illumination	More than 100 lux (9.3 footcandles)

Input and output connector

AEP, UK model

Video output	Phono jack, 1 Vp-p, 75 ohms unbalanced sync negative
Audio output	Phono jack Output: −7.5 dBs, (at output impedance 47 kilohms) impedance less than 2.2 kilohms

— Continued on next page —

8 VIDEO CAMERA RECORDER

SONY®

MICROFILM

ıstralian model

ı input/output
Selectable with IN/OUT selector
Phono jack (1), 1 Vp-p, 75 ohms
unbalanced sync negative

ı input/output
Selectable with IN/OUT selector
Phono jack (1)
Input: –75 dBs, input impedance
more than 47 kilohms
Output: –75 dBs, (at output
impedance 47 kilohms)
impedance less than 2.2
kilohms

. DC OUT Special minijack, DC 5V
ıhone jack Minijack, impedance 8 ohms
ıote jack Stereo mini-minijack
jack Minijack, –66 dBs, low inpedance
with 2.5 – 3 V DC output,
impedance 6.8 kilohms

ıeral

er requirements
On battery mounting surface
6.0 V (battery pack)
7.5 V (AC power adaptor)

ıer consumption
6.0 W (camera recording)
including the viewfinder

allation Vertically, Horizontally

rating temperature
0°C to 40°C (32° F to 104° F)

ıage temperature
–20°C to +60°C
(–4° F to +140° F)

ensions Approx. 127 × 122 × 185 mm (w/h/d)
(5 × 4 7/8 × 7 3/8)

Weig [illegible]
including the battery pack NP-5
lithium battery and cassette P5-9

Microphone Electret condenser microphone,
monaural type

Supplied accessories
- Wireless Remote Commander (1)
- Remote Commander holder (1)
- Battery pack NP-55 (1)
- AC power adaptor AC-V35/V35A (1)
- Lithium battery CR2025 (2)
  (for camcorder/for Remote Commander)
- RFU adaptor RFU-90E (1) (AEP model)
  RFU-90AS (1) (Australian model)
  RFU-89EA with an aerial selector and
  a screwdriver (1) (UK/E model)
- Shoulder strap (1)
- Jack cover (1)*
- Lens cap (1)*

Design and specifications are subject to change without notice.

Note
This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

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There is the color reproduction standard frame at the back of the book.

SERVICE NOTE

[HEAD CLEANING]

After an extended period of use the video image may become indistinct or may not appear at all during playback of a tape. The cause of this usually are dirty video heads. For remedy, cleaning of the heads is required.

Check for Head Clogs During Recording

① Use a blank tape, record a short section, then press the stop button to stop.
② Set to recording mode again.
③ If the [⊗] mark is flashing in the viewfinder at this time, head clogs are occurred.

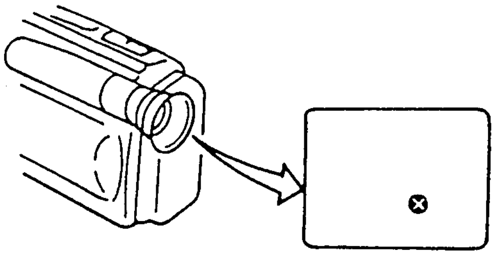
Check During Playback of a Tape

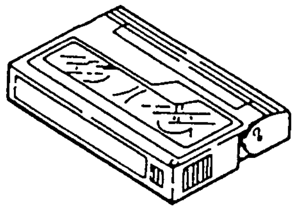
① Play back a pre-recorded tape and display the image on a TV screen.
② If there is no sound and the image is unstable, no image appears on the screen, or tape transport is unstable, head clogs are occurred.

Remedy

[Cleaning method using a cleaning tape]

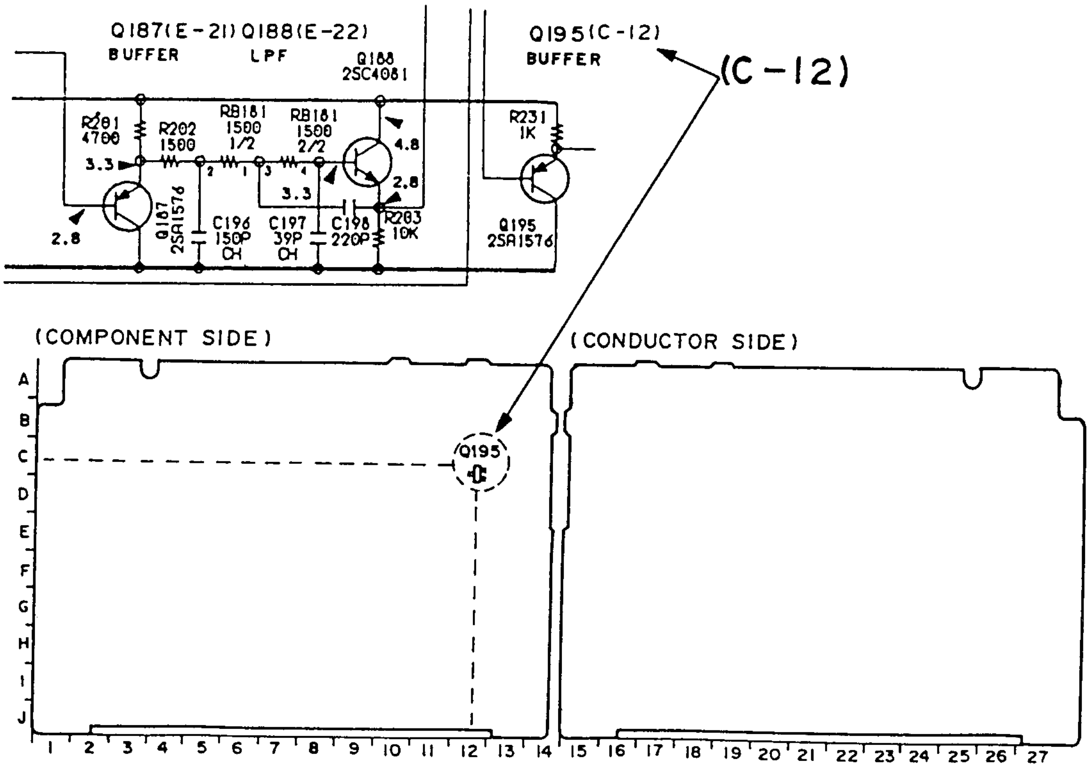
- Use the Cleaning Tape V8-6CLH. (Please follow the instructions attached to the cleaning tape.)





[SEMICONDUCTOR LOCATION]

In this service manual, the mounted locations of the semiconductors (IC, transistor, diodes) are indicated in red sa shown below. This enables to find the location on the board easily when servicing.


Q187(E-21) Q188(E-22)
BUFFER
LPF
Q188
2SC4081
R201
4700
R202
1500
RB181
1500
1/2
RB181
1500
2/2
3.3
4.8
2.8
3.3
2.8
Q187
2SA1576
C196
150P
CH
C197
39P
CH
C198
220P
R203
10K
Q195(C-12)
BUFFER
(C-12)
R231
1K
Q195
2SA1576
(COMPONENT SIDE)
(CONDUCTOR SIDE)
Q195
A
B
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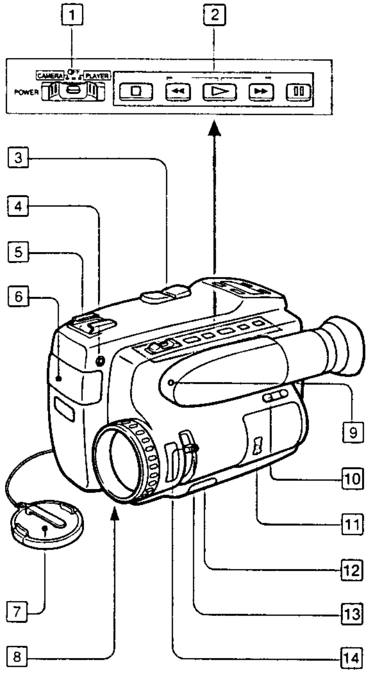
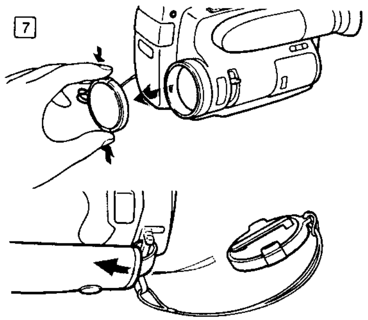
SECTION 1
GENERAL

This section is extracted from instruction manual.

Identifying the Parts

(A-1)





For details on the use of each control, refer to the pages indicated in the circle.

(A-1)

1 **POWER switch**
CAMERA: For camera recording
PLAYER: For playing back or editing tapes
OFF: Power off

2 **Tape transport buttons**
▷ (playback)
▶▶ FF (fast forward)
◀◀ REW (rewind)
□ (stop)
▯▯ (pause)

3 **Power zoom button ㉙**

4 **MIC jack (PLUG IN POWER)**
Connect an external microphone.
The MIC jack also accepts a "Plug-in-power" microphone and supplies power to it.

5 **Accessory shoe**
Attach a video light, etc.

6 **Built-in microphone**

7 **Lens cap**
To remove the lens cap, squeeze the sides as shown. Clip it on the grip strap.

8 **FADER button ㊵**

9 **Camera recording/battery lamp**
Lights during camera recording. It blinks when the battery is exhausted.

10 **EDITSEARCH ⊜ button ㉕ – ㉘**

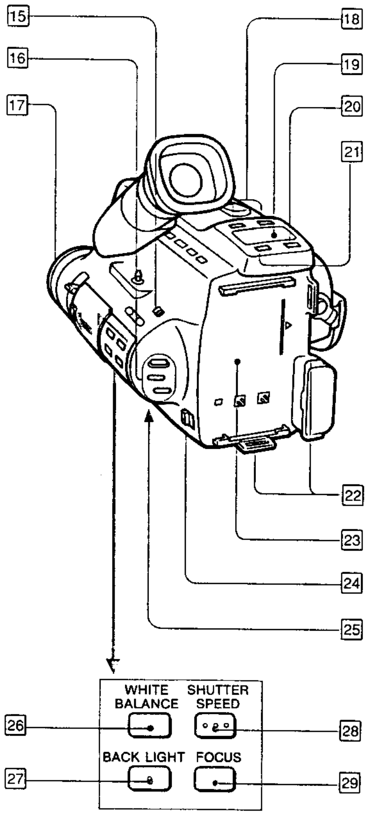
11 **AUTO LOCK cover ㉓, ㉚**
For manual adjustment, push the small button and slide the AUTO LOCK cover.

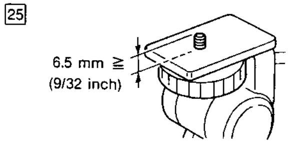
12 **Lithium battery compartment ⑱**

13 **Macro set button ㊴**

14 **Zoom lever ㉙**

(A-2)





Identifying the Parts

(A-2)

15 **REC (recording) MODE/EDIT switch ㉓, (51)**
Switch it depending on the operating mode.

Mode	Recording	Playback	Editing
Setting	⟷ REC MODE EDIT ▸ SP LP	⟵ EDIT ▸	⟶ EDIT ▸
Function	Recording mode switch	EDIT switch	

16 **Superimpose buttons ㊶**
MEMORY button
COLOR/MODE button
SUPERIMPOSE ON/OFF button

17 **Focus ring ㉜**

18 **DATE and TIME buttons ⑲, ㉕**
Press to display or turn off the date or time.

19 **Display window**

20 **ZERO MEM (zero memory) button ㉗, ㊿**
Use to memorize the counter zero point.

21 **RESET button ㉗, ㊿**
Press to reset the counter to zero.

22 **Hooks for shoulder strap**
Attach the shoulder strap.

23 **Battery mounting surface**

24 **BATT (battery eject) knob ⑭**

25 **Tripod receptacle**
Note when attaching a tripod not manufactured by Sony, the length of the camera mounting screw must be less than 6.5 mm. Otherwise the screw may damage the inner parts of the camera.

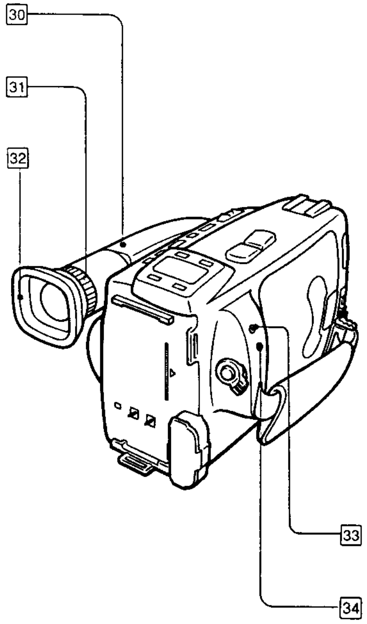
26 **WHITE BALANCE button ㉞**

27 **BACK LIGHT button ㉝**

28 **SHUTTER SPEED button ㊲**
Used to select the shutter speed.

29 **FOCUS button**
Used for manual focusing.

(A-3)



(A-3)

30 **Viewfinder**
The picture being recorded or played back can be monitored in monochrome here. Also marks such as the caution indicators and function modes appear in here.

31 **Viewfinder lens adjustment ring ㉒**
Adjust to your eyesight to assure good focus. Be sure to adjust this ring when shooting for the first time.

32 **Eyecup**

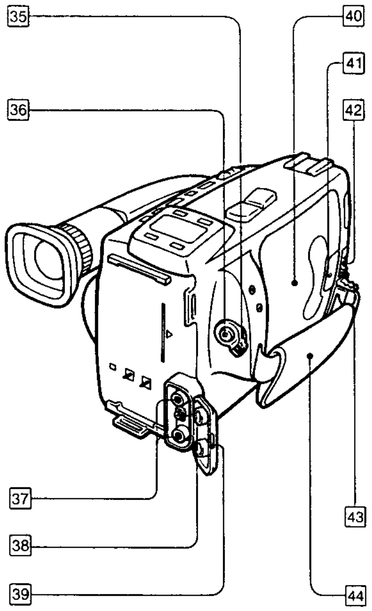
33 **REMOTE control jack (stereo mini-mini-jack)**
Connect a wired remote control unit, an editing controller, or other equipment here.

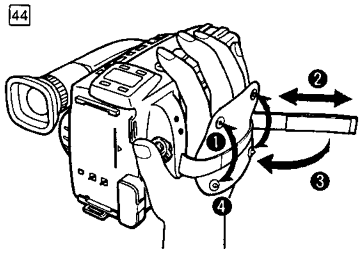
34 **(earphone) jack (mini-jack) ㉘**

About (LANC)

stands for Local Application Control Bus System. The connector is used for controlling the tape transport of video equipment and the peripherals connected to it. This connector has the same function as the connectors indicated as CONTROL L or REMOTE.

(A-4)





(A-4)

35 **STANDBY switch**
Turn to STANDBY to set the camcorder to the standby mode.

36 **START/STOP button**
Press to start and stop camera recording.

37 **V/A (video/audio) output jacks (phono jacks)**

38 **RFU DC OUT (RFU adaptor DC output) jack (special minijack)**
Attach the supplied RFU adaptor here if necessary.

39 **Jack cover**

40 **Cassette holder**

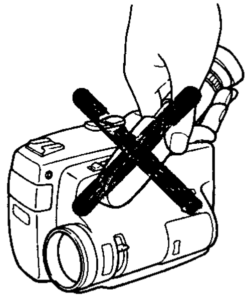
41 **PUSH CLOSE button ⑳**
Push to close the cassette holder.

42 **EJECT (cassette eject) button ⑳**

43 **Strap release knob ⑳**

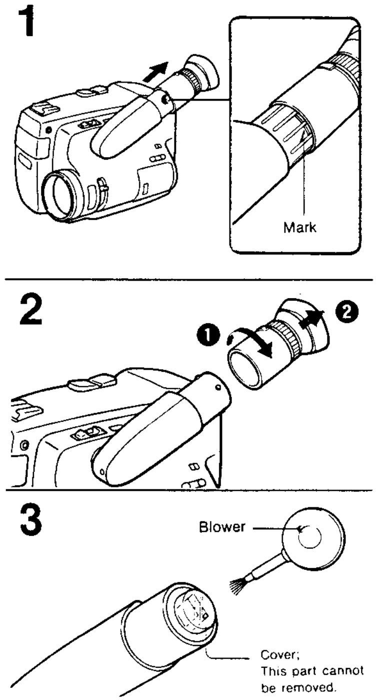
44 **Grip strap**
Adjust the length so that your thumb can easily manipulate the START/STOP button.

(A-5)



Caution (A-5)
Do not pick up the unit as shown in the illustration.

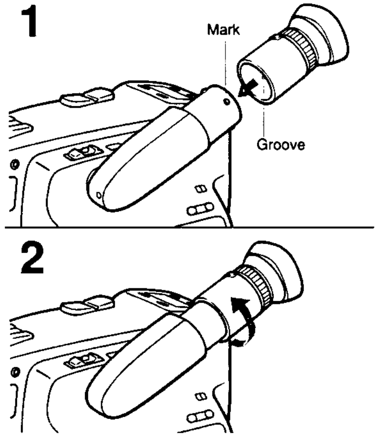
(A-6)



To remove dust from inside the viewfinder (A-6)

1. **Pull out the viewfinder barrel until the illustrated mark appears.**
2. **Turn the viewfinder counterclockwise until it stops and pull it out.**
3. **Clean the surface of the cover with a blower.**

(A-7)



To reattach the eyecup (A-7)

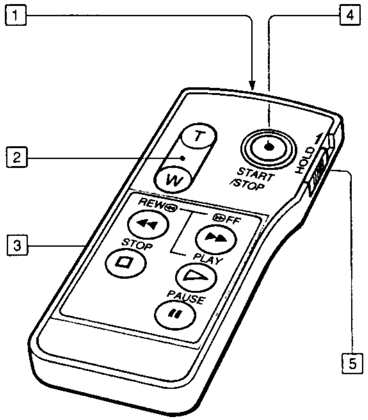
1. **Align the groove on the eyecup with the ● mark on the viewfinder barrel.**
2. **Turn the eyecup in the reverse direction of the arrow.**

Wireless Remote Commander

You can remotely record or play back a tape. The buttons on the Remote Commander with the same name or same mark as those on the camcorder have the same function.

When you use the Remote Commander
Be sure to set R REMOTE COMMANDER ON/OFF on the camcorder (bottom) to "ON", and then start operation of the camcorder, with the transmitter pointing towards the remote sensor. (See "Remotely controllable area" on page 10.)

(A-8)



1 Transmitter

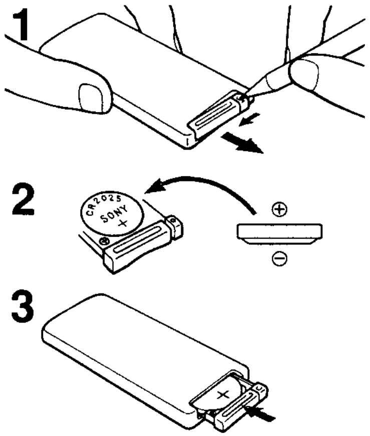
2 Power zoom button

3 Tape transport buttons
◀◀ REW (rewind) button
▶▶ FF (fast forward) button
□ STOP button
▷ PLAY button
❚❚ PAUSE button

4 START/STOP button

5 HOLD switch
Slide in the direction of the arrow to prevent the buttons from being accidentally depressed.

(A-9)



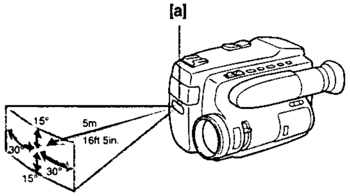
Installing the Lithium Battery (A-9)
Install the supplied CR2025 lithium battery into the Remote Commander with the polarities positioned correctly.

1 **Pull out the lithium battery holder from the Commander.**

2 **Install the lithium battery with the + side facing upward.**

3 **Put the lithium battery holder back into the Commander.**

(A-10)

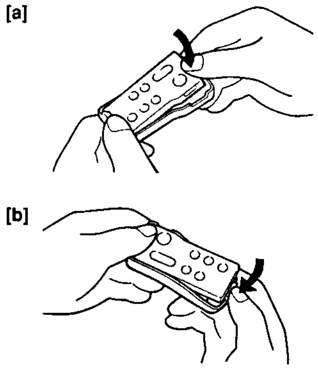


Remotely controllable area (A-10)
Point the Remote Commander towards the remote sensor **[a]**.

Notes on the Remote Commander

- Keep the remote sensor away from strong light sources such as direct sunlight or illumination. Otherwise the Remote control may not be effective.
- Be sure that there is no obstacle between the remote sensor and the Remote Commander.
- The command mode of the Commander is VTR2. Avoid using the Sony VTRs with the same command mode at the same time.
- Be sure to set the ▣ REMOTE COMMANDER ON/OFF which on the camcorder to OFF when you connect the receiver of a remote control kit (not supplied) to the REMOTE ◖ control jack.

(A-11)

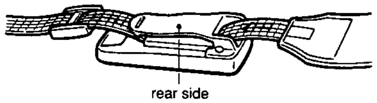


Lithium battery life
The battery lasts for approximately 6 months under normal operation.
When the Remote Commander does not work, the lithium battery becomes weak or dead.
In this case, **replace the battery with a Sony CR2025.**
Use of any other type of battery may present a risk of fire or explosion.

CAUTIONS

- Keep the lithium battery out of the reach of children. Should the battery be swallowed, immediately consult a doctor.
- Wipe the battery with a dry cloth to assure a good contact.
- Be sure to observe the correct polarity when installing the battery.
- Do not hold the battery with the metallic tweezers, otherwise a short-circuit may occur.
- The Battery may explode if mistreated.
  Do not recharge, disassemble, or dispose of in fire.

(A-12)



Attaching the Remote Commander to the Remote Commander holder (A-11)
[a] When attaching the Remote Commander to the Remote Commander holder
[b] When detaching the Remote Commander from the Remote Commander holder

You can clip the Remote Commander holder on your coat pocket or belt, or also slide it onto the shoulder belt before attaching the Remote Commander to it **(A-12)**.

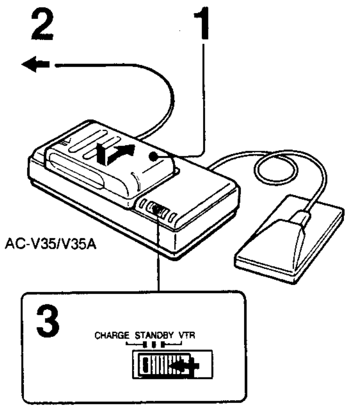
Connecting the Power Sources

First, Choose the Power Source.

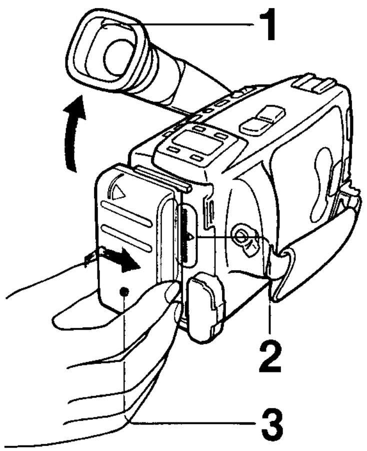
Place	Power source	Accessory to be used
Outdoors	Battery pack	Battery pack NP-55 (supplied), NP-55H, NP-66H, NP-77, NP-77H, NP-77HD
Indoors	House current	AC power adaptor AC-V35/V35A (supplied), AC-V55, AC-S10
In the car	12V or 24V car battery	DC pack DCP-77, AC power adaptor AC-V55 and the car battery cord DCC-16AE

Note on power source
Disconnecting the power source or removing the battery pack during recording or playback may damage the inserted tape. If disconnected accidently supply the power again immediately.

(B-1)



(B-2)



Using the Battery Pack

Step 1

Charge the battery pack. (B-1)

1. **Align the right side of the battery pack with the line on the AC power adaptor and slide in the battery pack to the right.**
2. **Connect the AC power adaptor to a wall outlet.**
3. **Set CHARGE/VTR to CHARGE.
Charging begins.**

Required charging time

NP-55 (supplied)	NP-55H	NP-66H	NP-77	NP-77H/77HD
60	70	110	120	140

Approximate minutes when using AC-V35/V35A.

See the instruction manual of the AC power adaptor for details.

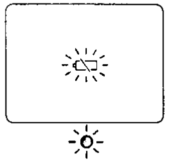
Step 2

Mount the battery pack on the camcorder. (B-2)

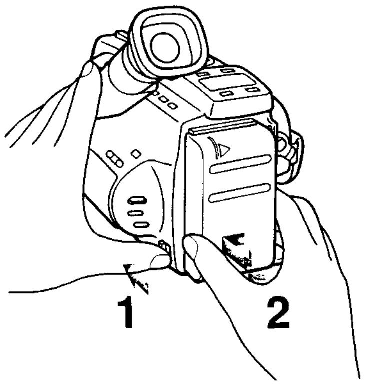
1. **Lift up the viewfinder.**
2. **Align the right side of the battery pack with the line on the camcorder.**
3. **Slide the battery pack to the right.**

Note
Make sure the battery is securely installed so that it does not fall. If the battery is not installed properly, the camcorder will not record accurately.

(B-3)



(B-4)



Connecting the Power Sources

Battery life
A fully charged battery pack lasts for:

NP-55*	NP-55H	NP-66H	NP-77	NP-77H/77HD
50	60	90	110	130

(Approx. minutes, continuous recording when used indoors)
* Supplied

When the battery becomes weak
(B-3)

The ▭ indication and red lamp blink slowly in the viewfinder. Replace the battery pack with a fully charged one, when they blink rapidly.

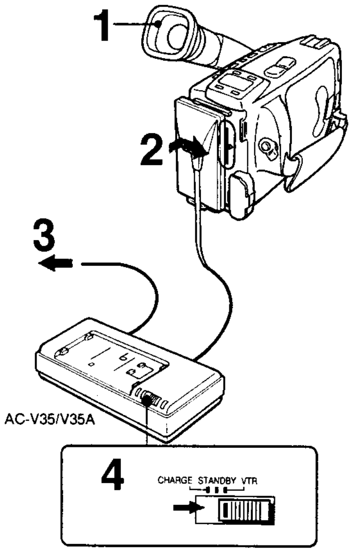
To remove the battery pack
(B-4)

While pressing the BATT knob in the direction of arrow, slide to the left and pull out the battery pack as illustrated.

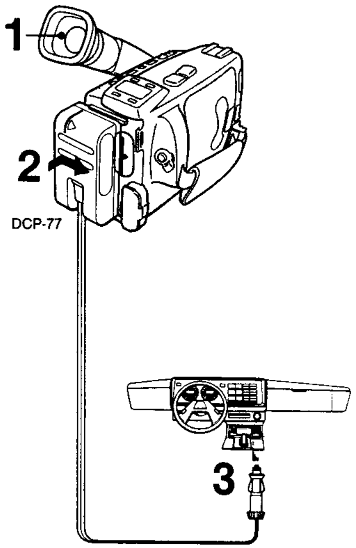
Other options for charging

- AC-V55 AC power adaptor: You can charge two battery packs one after another.
- AC-S10 AC power adaptor:
  You can charge a battery pack whether it is used up or not with this adaptor because it has discharging function.
- BC-55 portable battery charger: You can charge a battery pack on 100—240 V AC.
- DC-V30 car battery charger: You can charge a battery by connecting the car battery charger to the cigarette lighter socket. This battery charger can also supply power for Sony 8 mm video equipment that operates on a battery pack.
- NP-4000 rechargeable battery pack: You can use it for long outdoor recording.

(B-5)



(B-6)



Connecting the Power Sources

Using House Current

(B-5)

Use the supplied AC-V35/V35A AC power adaptor.

1 **Lift up the viewfinder.**

2 **Align the right side of the connecting plate with the line on the camcorder, and slide it in to the right.**

3 **Connect the AC power adaptor to a wall outlet.**

4 **Set CHARGE/VTR to VTR.**

We recommend the use of the AC power adaptor while viewing the playback picture on the TV, editing tapes or recording a TV program, as you do not need to worry about running out of power.
See the instruction manual of the AC power adaptor for details.

Other option
The AC-V55/AC-S10 AC power adaptor can also be used.

Using Car Battery

(B-6)

The DCP-77 DC pack is required (not supplied).

1 **Lift up the viewfinder.**

2 **Align the right side of the DC pack with the line on the camcorder, and slide it in to the right.**

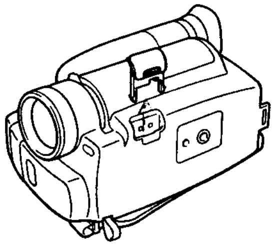
3 **Connect the cord to the cigarette lighter socket of a car (12V or 24V).**

To remove the DC pack
While pressing the BATT knob on the camcorder, slide the DC pack to the left and pull it out.

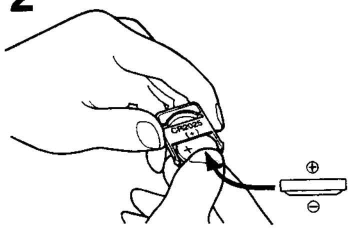
Other option
The AC-V55 AC power adaptor and the DCC-16AE car battery cord can also be used to operate this camcorder on a 12V or 24V car battery.

(C-1)

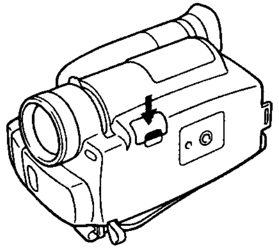
1



2



3



Setting the Date and Time

Inserting the Lithium Battery

(C-1)

This camcorder uses a lithium battery to activate the clock and to keep titles in memory. Before operating it for the first time, install the supplied lithium battery.

1 **Pull out the lithium battery holder from the bottom of the camcorder.**

2 **Install the supplied CR2025 lithium battery with the + side facing the (+) on the battery holder.**

3 **Put the lithium battery holder back into the camcorder.**

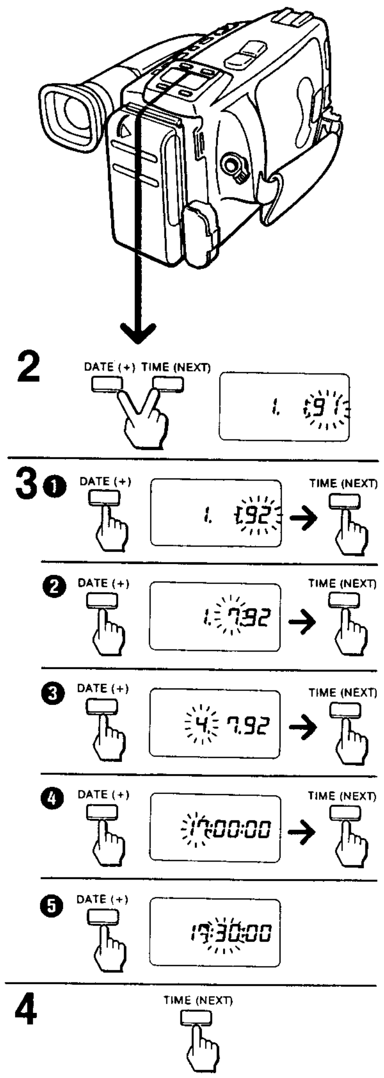
To change the lithium battery
Remove the lithium battery holder from the camcorder, and pull out the lithium battery and insert a new one.

Note on battery life
The battery lasts for approximately 1 year under normal operation. When the lithium battery becomes weak, the time indication keeps blinking in the display window and blinks in the viewfinder for about 5 seconds when the POWER switch is set to CAMERA. When this happens, **replace the battery with a Sony CR2025 lithium battery. Use of another battery may present a risk of fire or explosion.** While replacing the lithium battery, keep the battery pack or other power source attached. Otherwise, you must readjust the date, time and title.

Cautions

- Keep the lithium battery out of the reach of children.
  Should the battery be swallowed, consult a doctor immediately.
- Wipe the battery with a dry cloth to assure good contact.
- Be sure to install the battery with the correct polarity.
- Do not hold the battery with metallic tweezers, as a short-circuit may occur.
- Battery may explode if mistreated. Do not recharge, disassemble, or dispose of in a fire.

(C-2)



Setting the Date and Time

(C-2)

1 **Make sure that a power source is connected, set POWER to CAMERA, and turn STANDBY to STANDBY.**

2 **Press DATE and TIME simultaneously for more than 3 seconds until the date indication appears in the display window. DATE now functions as + (to advance numbers) and TIME functions as NEXT (to execute).**

3 **Set the year, month, day, hour and minute, in this order.**
First adjust the blinking digits with + and then press NEXT.

4 **Press NEXT to set the second.**
The clock starts operating.

To correct the date and time setting
Press NEXT repeatedly until the minute digits stop flashing.
Repeat steps 2 to 4.

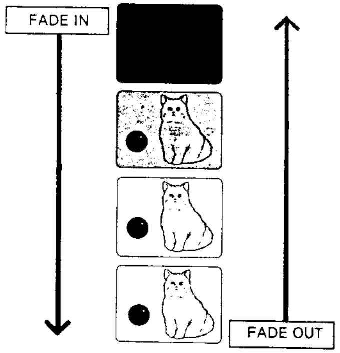
To advance the digits faster
Keep + pressed.

To check the preset date and time
Press DATE or TIME. When you press the same button again, the indication goes off.

Fade-in and Fade-out

When fading-in, the picture will gradually appear from a black screen. The sound will also gradually increase.
When fading-out, the picture will gradually disappear to a black screen. The sound will also gradually decrease.
This function will give your recording a professional appearance. **(N-1)**

(N-1)

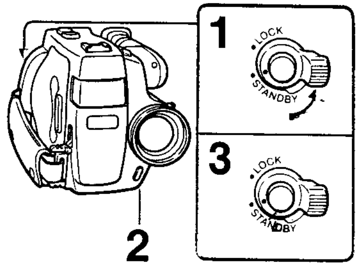


To Fade-in

(N-2)

1. **Turn STANDBY to STANDBY to set the camcorder in the standby mode.**
2. **Press FADER.**
   The "FADER" indication appears in the viewfinder.
3. **Press START/STOP.**
   Fade-in is performed and then recording will start.

(N-2)

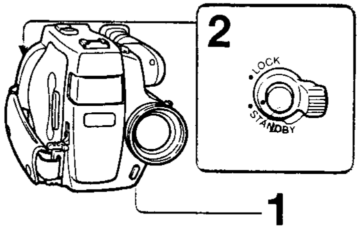


To Fade-out

(N-3)

1. **While recording, press FADER.**
   The "FADER" indication appears in the viewfinder.
2. **Press START/STOP to stop the recording.**
   Fade-out is performed and then recording stops.

(N-3)



To cancel the fade-in/fade-out function before it is performed
Press FADER again before pressing START/STOP.

If you want to use the fade-in/fade-out function repeatedly
Start from step 1 each time.

When the date is displayed
The date and title do not fade-in or fade-out.

Recording a Title

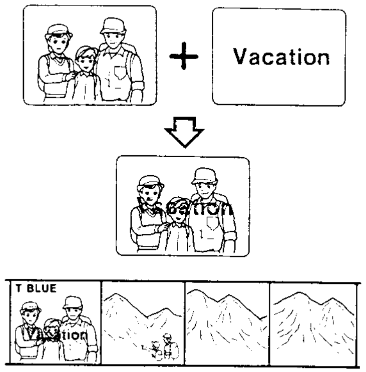
You can superimpose your own hand-lettered message or illustration over the picture during recording. **(O-1)**

- One title can be stored
- The colour of the title can be selected from 8 colours.

To make a desired title card, use a plain, white card and write a title using a dark colour and thick lines.

Before recording, store the title or illustration.

(O-1)



Storing a Title

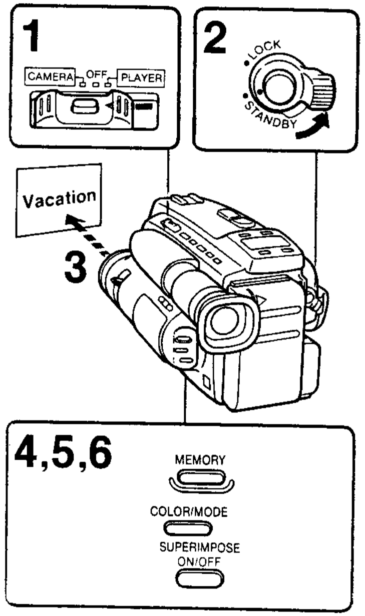
(O-2)

Make sure that the lithium battery is installed.

1. **While pressing the green button, set POWER to CAMERA.**
2. **Turn STANDBY to STANDBY to set the camcorder in the standby mode.**
3. **Point the camcorder to the title card and adjust the focus.**
   To focus the subject, use the close-up function if necessary.
4. **Press MEMORY to store the title.**
5. **Press COLOR/MODE and select the title colour.**
   Each time you press the button the indication changes as follows.

   WHT (white) → BLUE → GRN (green) → CYAN
   ↑ ↓
   BLK (black) ← YEL (yellow) ← VIO (violet) ← RED
6. **Press SUPERIMPOSE ON/OFF to turn off the title.**

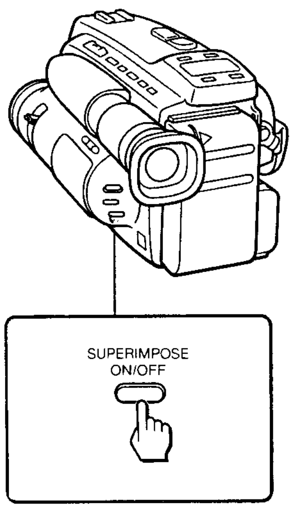
(O-2)



To check the title
Press SUPERIMPOSE ON/OFF in the standby mode. To turn off the title, press the button again.

About memory back up
The camcorder uses a lithium battery (located on the bottom of the unit) to keep the title in memory. On lithium battery life, see page 18.

(O-3)



Superimposing the Title on a Picture

(O-3)

1 **During recording, press SUPERIMPOSE ON/OFF at the point from which you want to insert the title.**
The title is displayed. During recording, the title is recorded.

2 **Wait for a while and at the point you want to turn off the title, press SUPERIMPOSE ON/OFF again.**
The title goes out.

When recording the title at the beginning
We recommend the following method:

1 **Set the camcorder in the standby mode.**

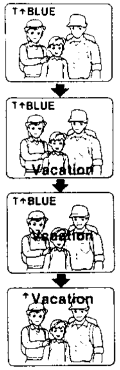
2 **Press SUPERIMPOSE ON/OFF.**

3 **Start recording with the title displayed in the viewfinder.**

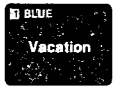
4 **Wait for a while and at the point you want to turn off the title, press SUPERIMPOSE ON/OFF again.**

About the colour indication
- The colour indication in the viewfinder is not recorded.
- You can change the title colour by pressing COLOR/MODE even after displaying the title.

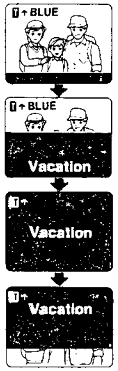
(O-4)



(O-5)



(O-6)



(O-7)

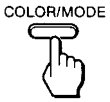
Various Display Modes of the Title

Display mode	Indication in the viewfinder
Scrolling up the title (O-4) The title scrolls up.	↑
Reversing the title with the picture (O-5)	T
Scrolling up the reversed title (O-6)	T↑
Normal display mode	No indication

Selecting the display mode
Before displaying the title, press COLOR/MODE until the indication of the mode you want appears. **(O-7)**

After selecting the mode
Follow the procedure on page 42 to superimpose the title on the picture in that mode.

(O-8)



Recording a Title

Function of the COLOR/MODE button

This button has a double function: one is to select the title colour and the other is to select the title display mode. Its function depends on whether the title is displayed or not. **(O-8)**

To select the colour

1 **Press SUPERIMPOSE ON/OFF to display the title.**

2 **Press COLOR/MODE.**
Each time you press the button, the colour indication changes as follows.

WHT (white) → BLUE → GRN (green) → CYAN
↑ ↓
BLK (black) ← YEL (yellow) ← VIO (violet) ← RED

To select the mode

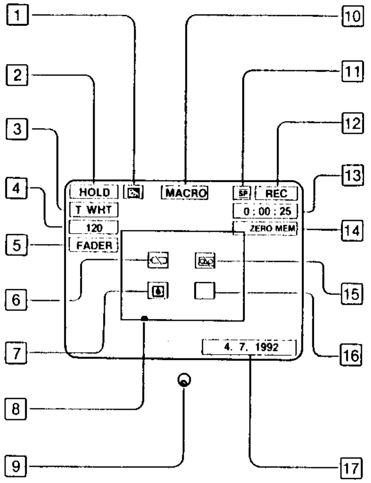
1 **If the title is displayed, press SUPERIMPOSE ON/OFF so that the title disappears.**

2 **Press COLOR/MODE.**
Each time you press the button, the mode indication changes as follows.

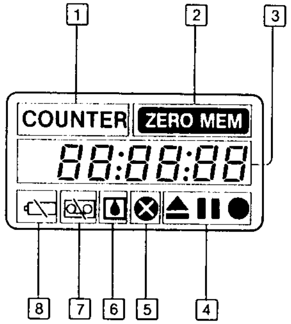
No indication (no title mode) → ↑ → 🆃 → 🆃↑

↑: Title scroll up mode
🆃: Title reverse mode
🆃↑: Title reverse and scroll up mode

(V-1)



(V-2)



Indications Inside the Viewfinder and the Display Window

Inside the Viewfinder

(V-1)

- **1 BACK LIGHT is pressed.**
- **2 White balance mode (☀/💡/HOLD)**
- **3 Title mode**
- **4 Shutter speed**
- **5 FADER is pressed.**
- **6 “Replace battery.”**
- **7 Moisture condensation.**
- **8 Auto focus adjusting range**
  Goes out during manual focusing
- **9 Shows up during recording.**
  When blinking: “Replace battery.”
- **10 In the MACRO range**
- **11 Recording/Playback mode (LP/SP)**
- **12 Tape transport and camera recording mode**
- **13 Tape counter**
- **14 ZERO MEM is pressed.**
- **15 “Exchange tape.”**
- **16 “Clean video heads.” or other caution (⊗, ⏏)**
- **17 Date or time**

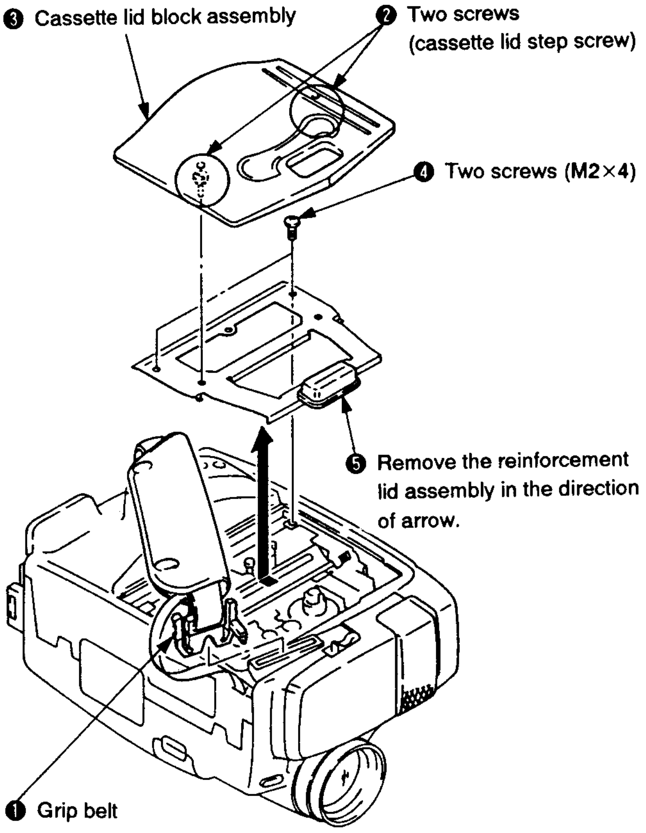
Display window

(V-2)

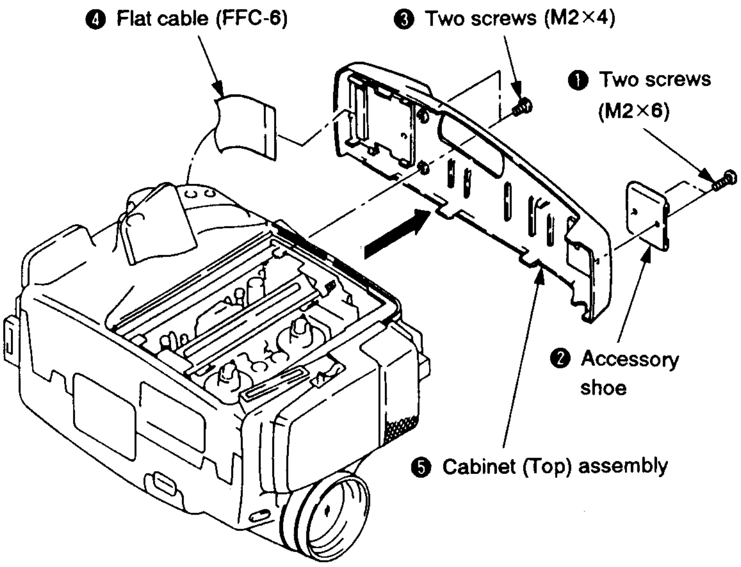
- **1 Tape counter.**
- **2 ZERO MEM is pressed.**
- **3 Date or time/tape counter**
- **4 Tape transport**
- **5 Caution**
- **6 Moisture condensation**
- **7 Exchange tape**
- **8 Replace battery**

SECTION 2
DISASSEMBLY

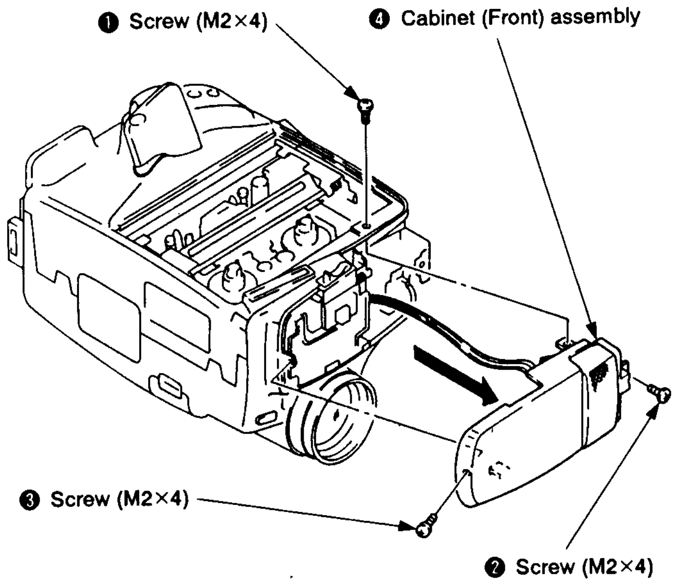
2-1. REMOVAL OF CASSETTE LID BLOCK ASSEMBLY


❸ Cassette lid block assembly
❷ Two screws (cassette lid step screw)
❹ Two screws (M2×4)
❺ Remove the reinforcement lid assembly in the direction of arrow.
❶ Grip belt

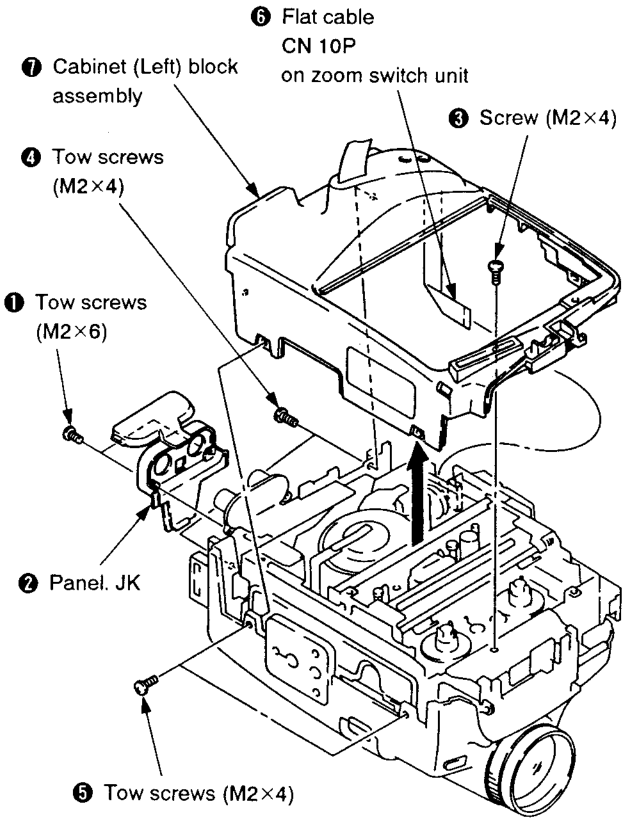
2-2. REMOVAL OF CABINET (TOP) ASSEMBLY


❹ Flat cable (FFC-6)
❸ Two screws (M2×4)
❶ Two screws (M2×6)
❷ Accessory shoe
❺ Cabinet (Top) assembly

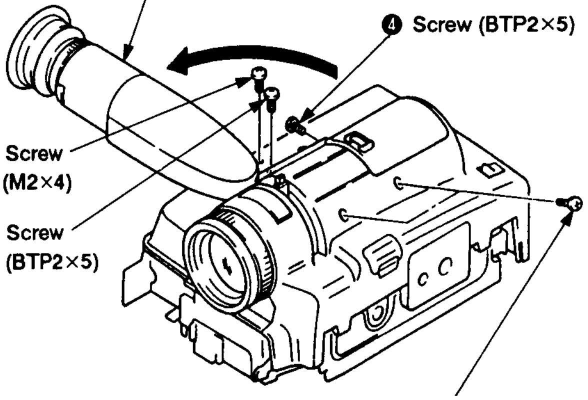
2-3. REMOVAL OF CABINET (FRONT) ASSEMBLY


❶ Screw (M2×4)
❹ Cabinet (Front) assembly
❸ Screw (M2×4)
❷ Screw (M2×4)

2-4. REMOVAL OF CABINET (LEFT) BLOCK ASSEMBLY


❻ Flat cable CN 10P on zoom switch unit
❼ Cabinet (Left) block assembly
❸ Screw (M2×4)
❹ Tow screws (M2×4)
❶ Tow screws (M2×6)
❷ Panel. JK
❺ Tow screws (M2×4)

2-5. REMOVAL OF VTR AND CAMERA BLOCK

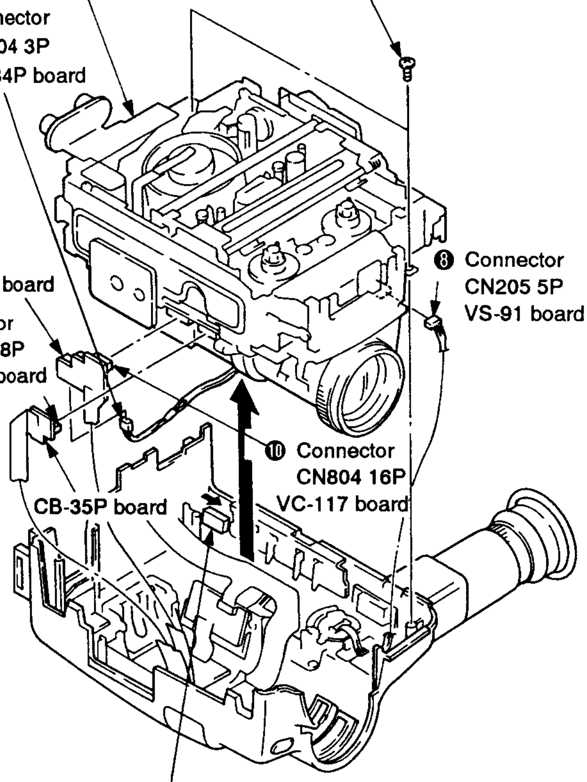

❸ Move the EVF asssembly in the direction of arrow.

❹ Screw (BTP2×5)

❺ Screw (M2×4)

❷ Screw (BTP2×5)

❶ Two screws (BTP2×5)
Note: It is set slantwiss.


❼ Lift up the VTR and CAMERA blocks in the direction of arrow.
(**Note:** In the this state remove respective connectors)

❻ Two screws (BTP2×5)

⓫ Connector
CN904 3P
CB-34P board

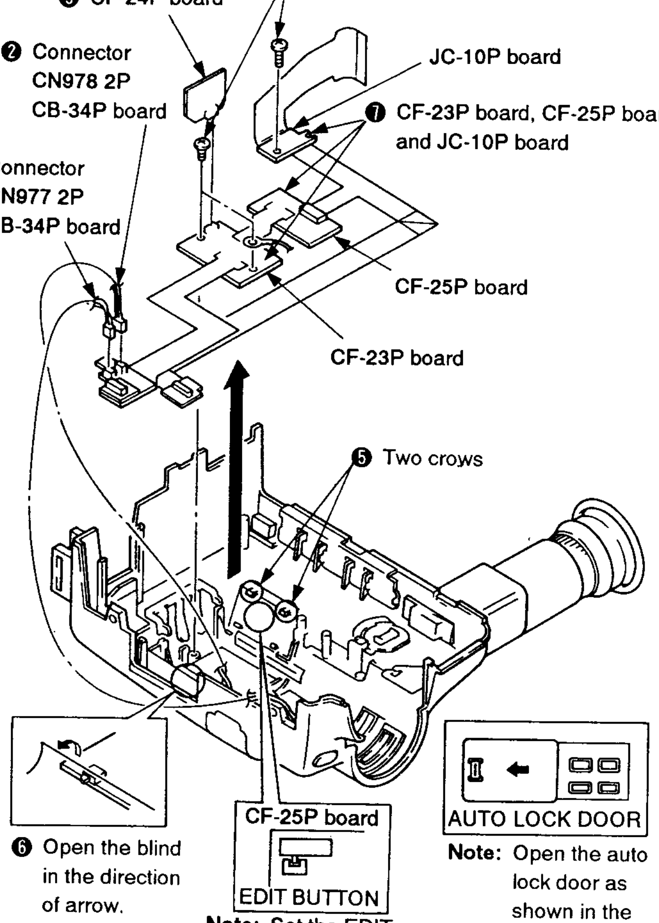
❽ Connector
CN205 5P
VS-91 board

❾ Connector
CN806 18P
VC-117 board

❿ Connector
CN804 16P
VC-117 board

Note: When installing cabinet (right) block assembly, set the holder knob the direction of arrow.

2-6. REMOVAL OF CF-23P BOARD, CF-24P BOARD, CF-25P BOARD AND JC-10P BOARD


❹ Three screws (B2×5)

❸ CF-24P board

❷ Connector
CN978 2P
CB-34P board

❶ Connector
CN977 2P
CB-34P board

❼ CF-23P board, CF-25P board and JC-10P board

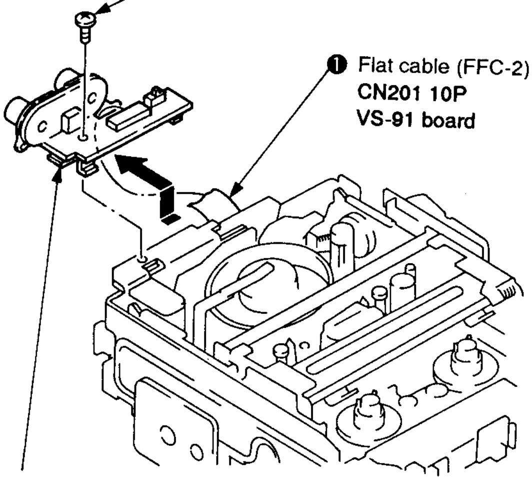
❺ Two crows

❻ Open the blind in the direction of arrow.

Note: Set the EDIT button as shown in the figure when mounting the CF-25P board.

Note: Open the auto lock door as shown in the figure when mounting the CF-23P board.

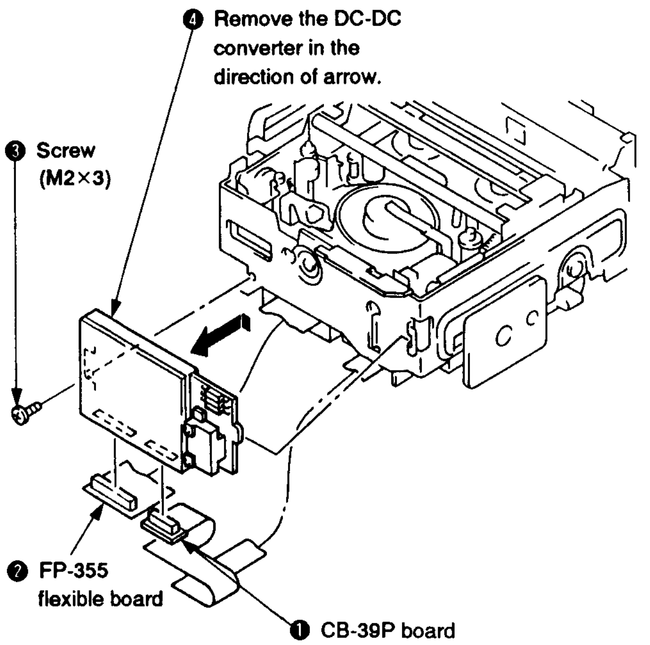
2-7. REMOVAL OF PIN JACK ASSEMBLY


❷ Screw (M2×3)

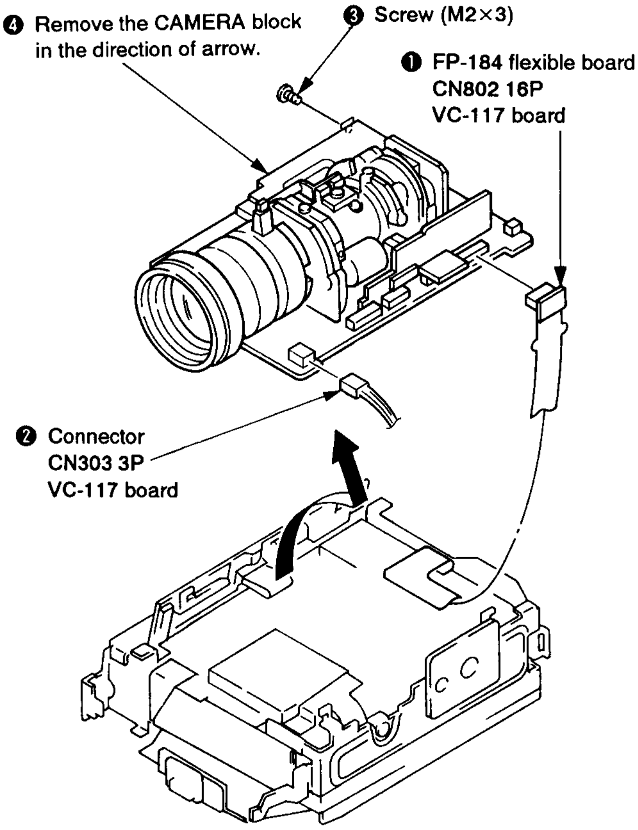
❶ Flat cable (FFC-2)
CN201 10P
VS-91 board

❸ Remove the Pin jack assembly in the direction of arrow.

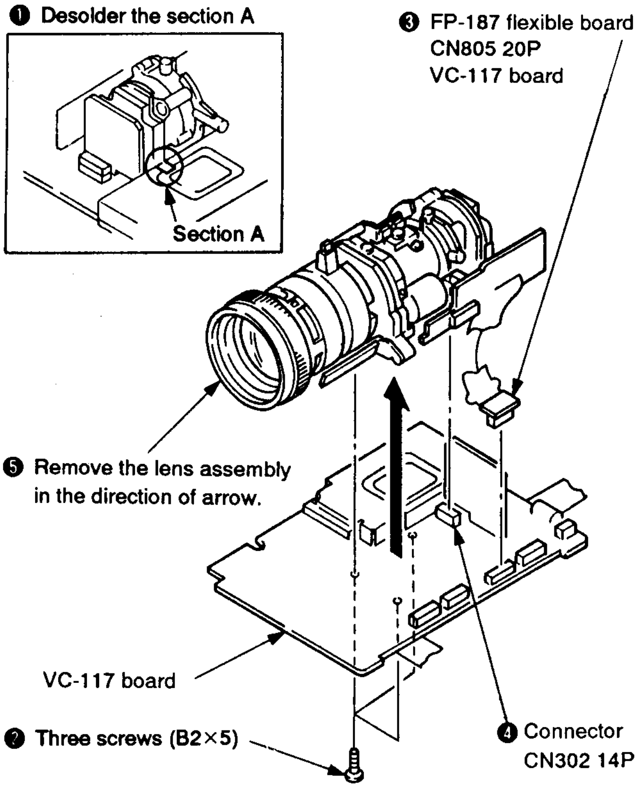
2-8. REMOVAL OF DC-DC CONVERTER UNIT


❶ CB-39P board
❷ FP-355 flexible board
❸ Screw (M2×3)
❹ Remove the DC-DC converter in the direction of arrow.

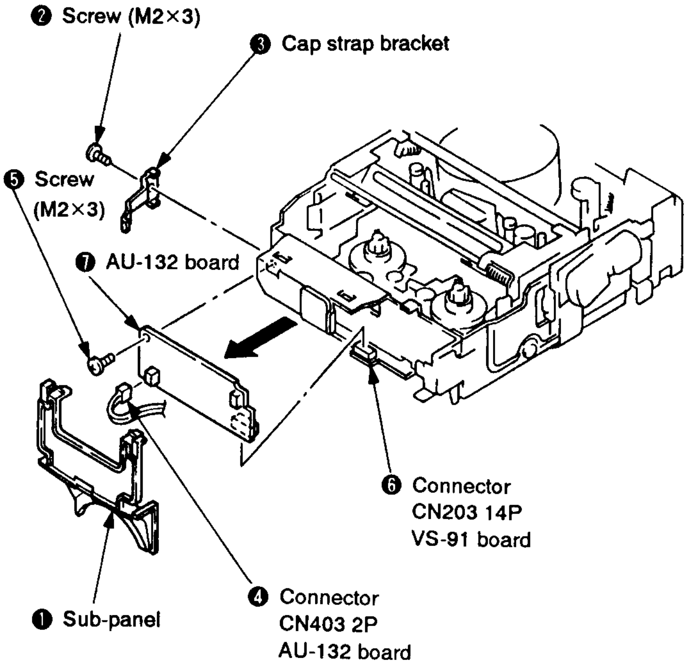
2-9. REMOVAL OF CAMERA BLOCK


❶ FP-184 flexible board CN802 16P VC-117 board
❷ Connector CN303 3P VC-117 board
❸ Screw (M2×3)
❹ Remove the CAMERA block in the direction of arrow.

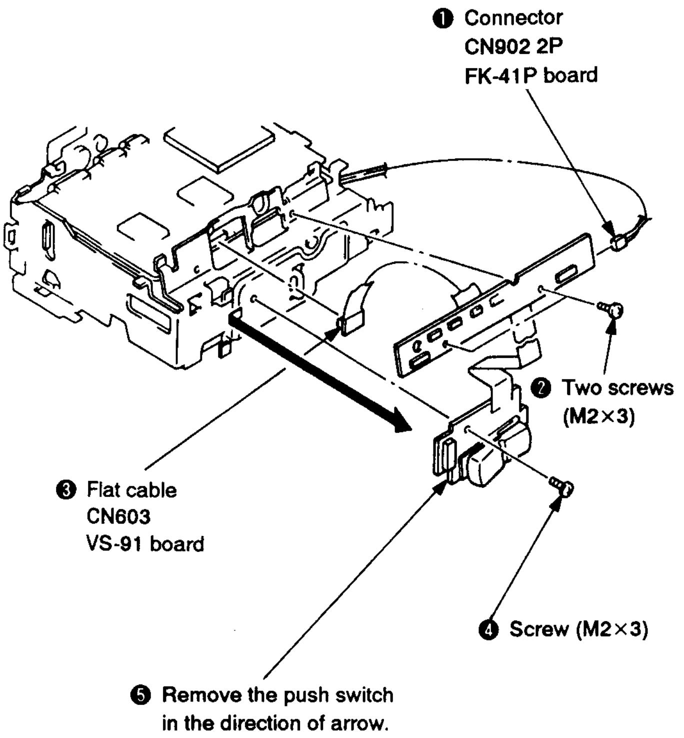
2-10. REMOVAL OF LENS ASSEMBLY


❶ Desolder the section A
Section A
❷ Three screws (B2×5)
❸ FP-187 flexible board CN805 20P VC-117 board
❹ Connector CN302 14P
❺ Remove the lens assembly in the direction of arrow.
VC-117 board

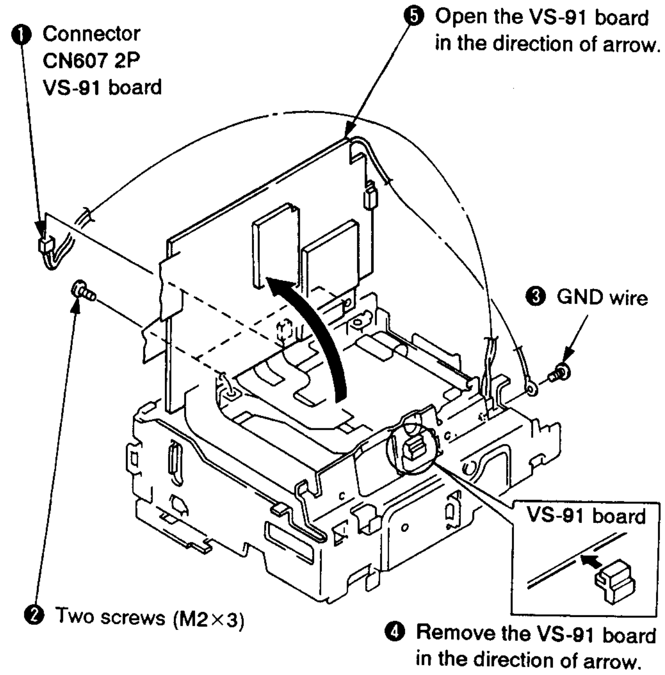
2-11. REMOVAL OF AU-132 BOARD

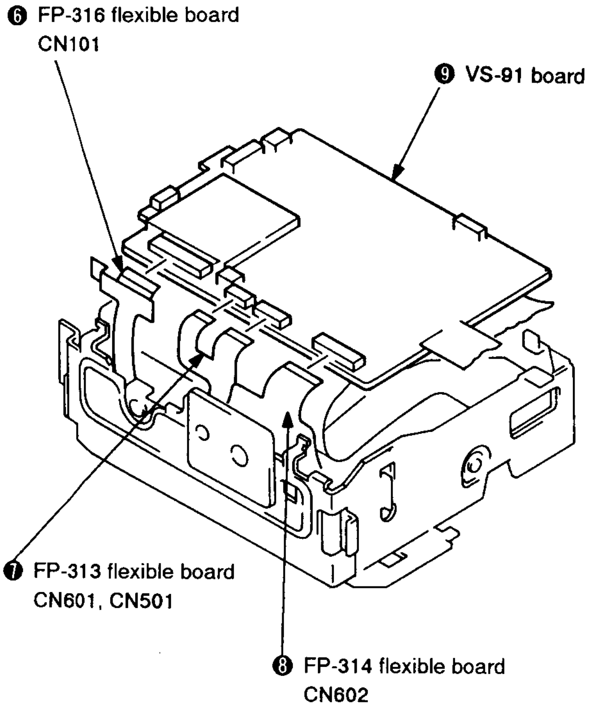

❶ Sub-panel
❷ Screw (M2×3)
❸ Cap strap bracket
❹ Connector CN403 2P AU-132 board
❺ Screw (M2×3)
❻ Connector CN203 14P VS-91 board
❼ AU-132 board

2-12. REMOVAL OF FK-41P AND PUSH SWITCH

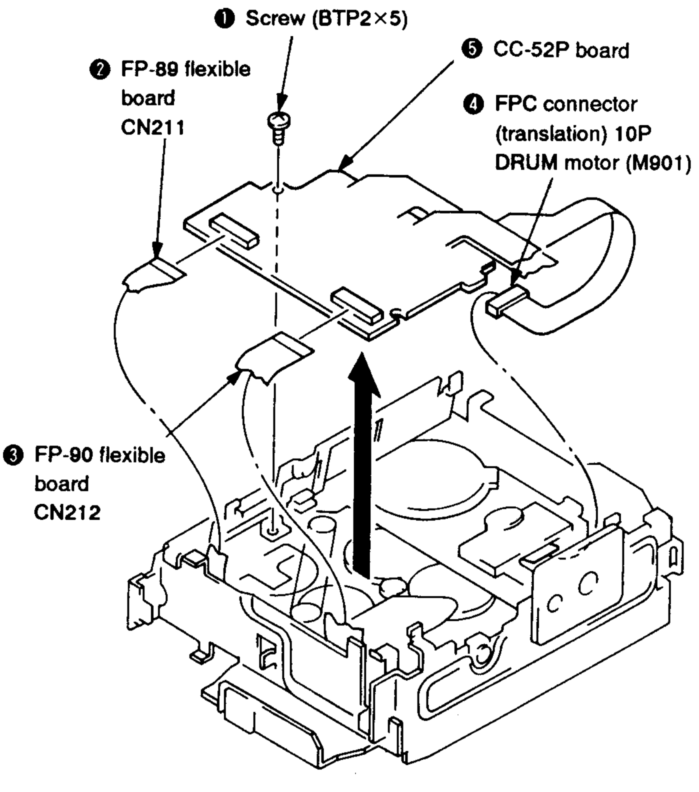

❶ Connector
CN902 2P
FK-41P board
❷ Two screws
(M2×3)
❸ Flat cable
CN603
VS-91 board
❹ Screw (M2×3)
❺ Remove the push switch
in the direction of arrow.

2-13. REMOVAL OF VS-91 BOARD

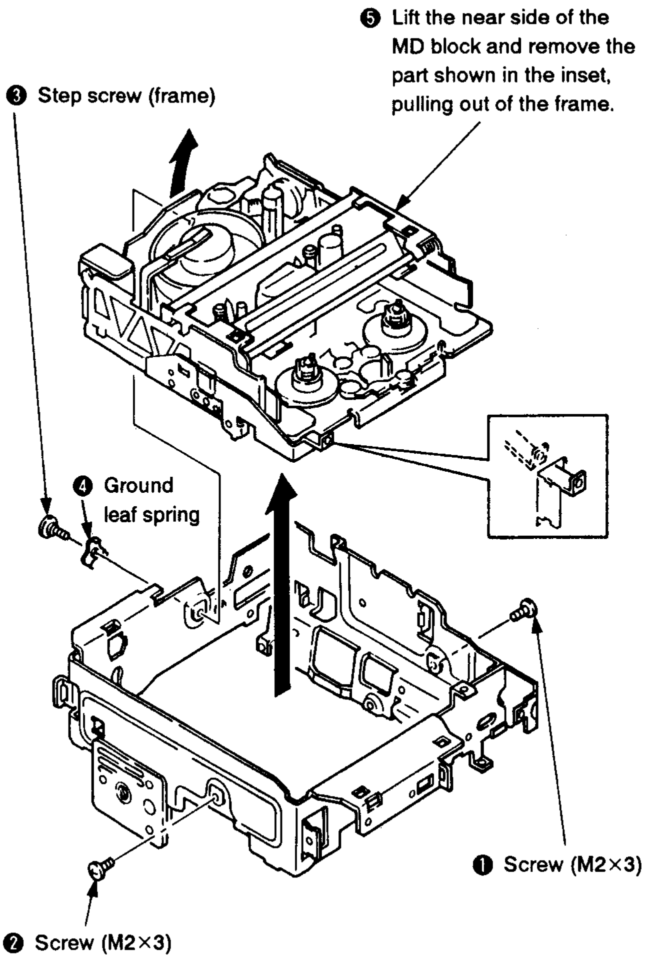

❶ Connector
CN607 2P
VS-91 board
❺ Open the VS-91 board
in the direction of arrow.
❸ GND wire
VS-91 board
❷ Two screws (M2×3)
❹ Remove the VS-91 board
in the direction of arrow.


❻ FP-316 flexible board
CN101
❾ VS-91 board
❼ FP-313 flexible board
CN601, CN501
❽ FP-314 flexible board
CN602

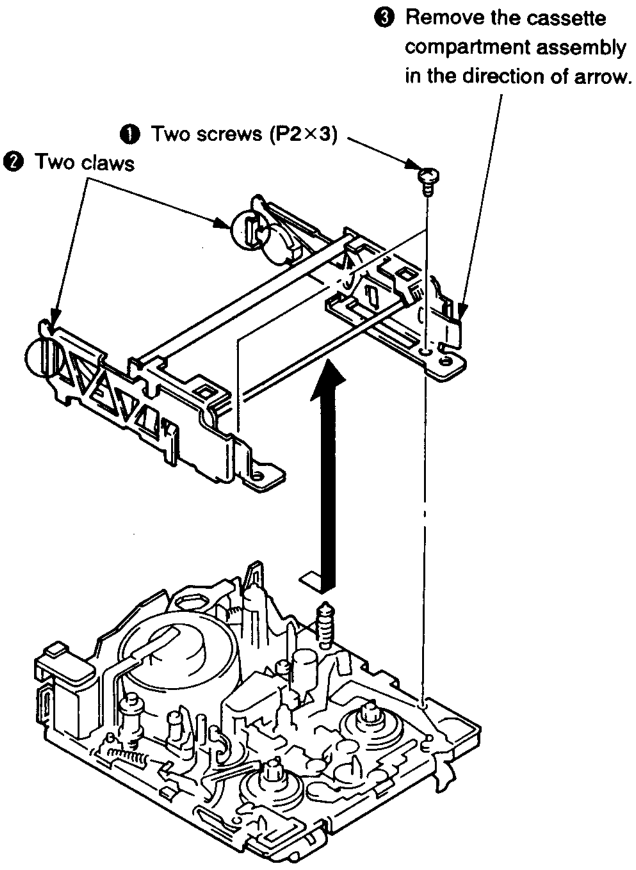
2-14. REMOVAL OF CC-52P BOARD


❶ Screw (BTP2×5)
❷ FP-89 flexible
board
CN211
❺ CC-52P board
❹ FPC connector
(translation) 10P
DRUM motor (M901)
❸ FP-90 flexible
board
CN212

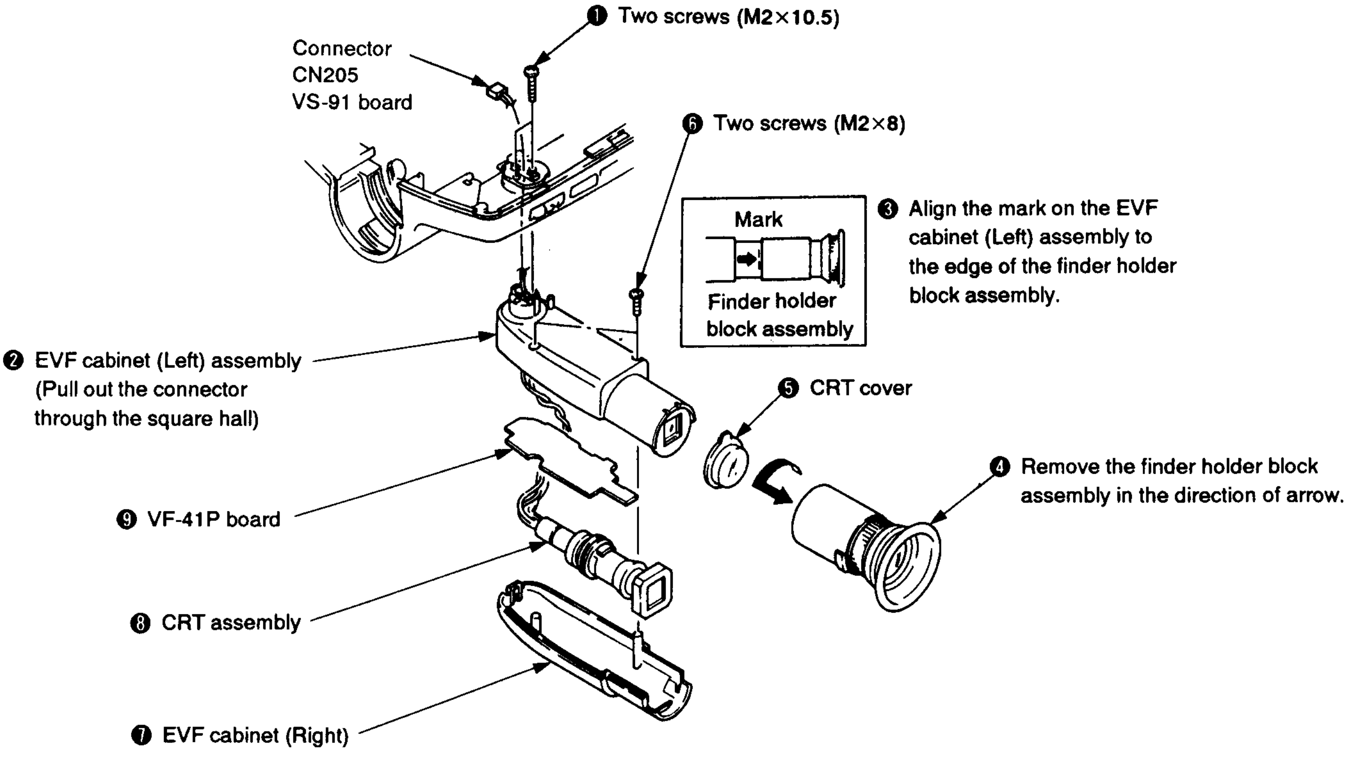
2-15. REMOVAL OF MD BLOCK


❺ Lift the near side of the MD block and remove the part shown in the inset, pulling out of the frame.
❸ Step screw (frame)
❹ Ground leaf spring
❶ Screw (M2×3)
❷ Screw (M2×3)

2-16. REMOVAL OF CASSETTE COMPARTMENT ASSEMBLY

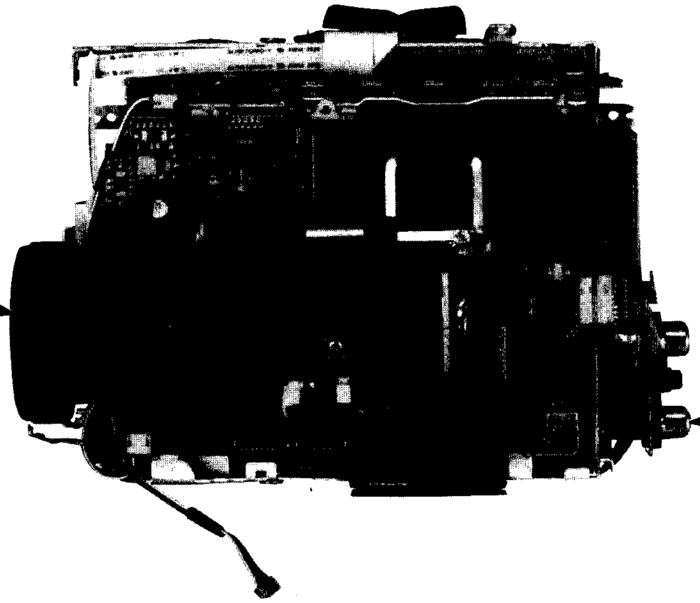

❸ Remove the cassette compartment assembly in the direction of arrow.
❶ Two screws (P2×3)
❷ Two claws

2-17. REMOVAL OF EVF ASSEMBLY


❶ Two screws (M2×10.5)
Connector CN205 VS-91 board
❻ Two screws (M2×8)
Mark
Finder holder block assembly
❸ Align the mark on the EVF cabinet (Left) assembly to the edge of the finder holder block assembly.
❷ EVF cabinet (Left) assembly (Pull out the connector through the square hall)
❺ CRT cover
❹ Remove the finder holder block assembly in the direction of arrow.
❾ VF-41P board
❽ CRT assembly
❼ EVF cabinet (Right)

2-18. INTERNAL VIEW

– **Right Side** –

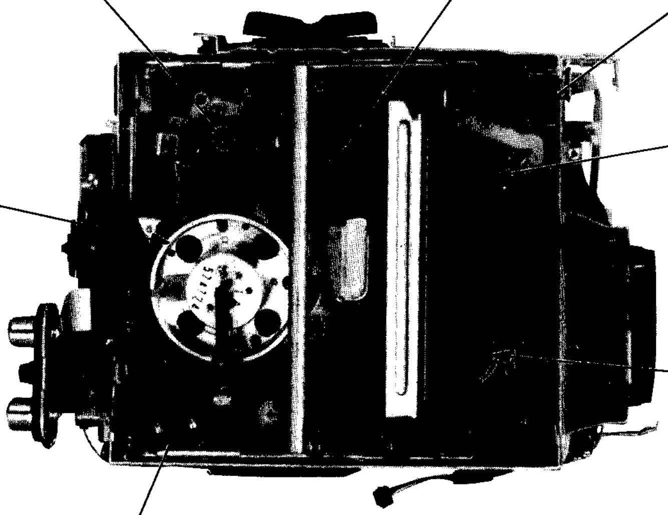


Zoom lens
(VCL-6210WA)
1-547-516-11

Pin jack assembly
(AUDIO/VIDEO
input/output)
1-580-327-11
(E, Australian model)

(AUDIO/VIDEO
input/output)
1-580-327-21
(AEP, UK model)

– **Left Side** –



M902 motor (U-22A)
8-835-331-31

Pinch roller

RECOG switch
1-572-298-11

M901
Drum assembly
(DGU-64A-R)
A-7048-405-A

Rotary upper drum assembly
(DGR-64-R)
A-7049-343-A

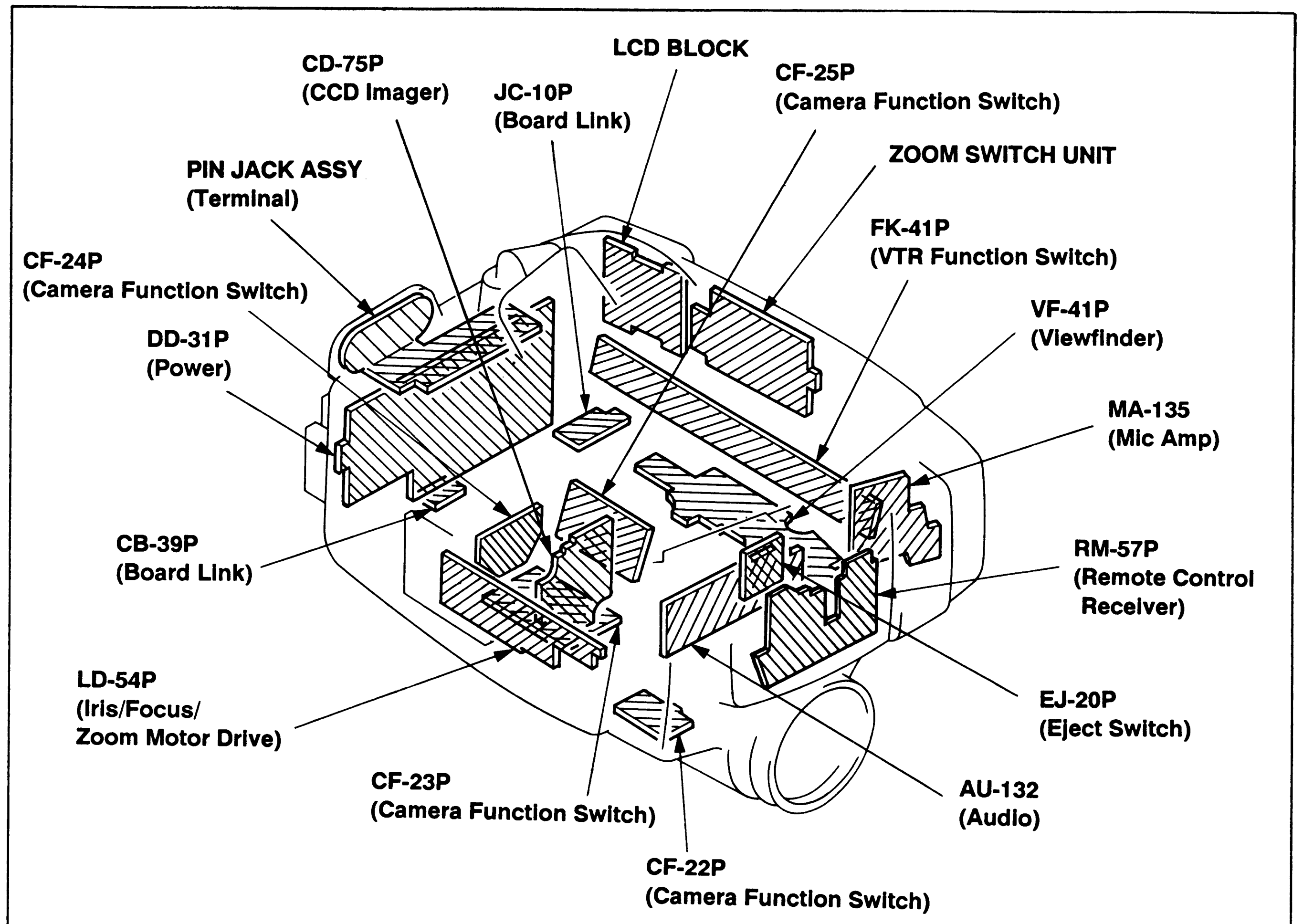
T reel table assembly
X-3728-855-6

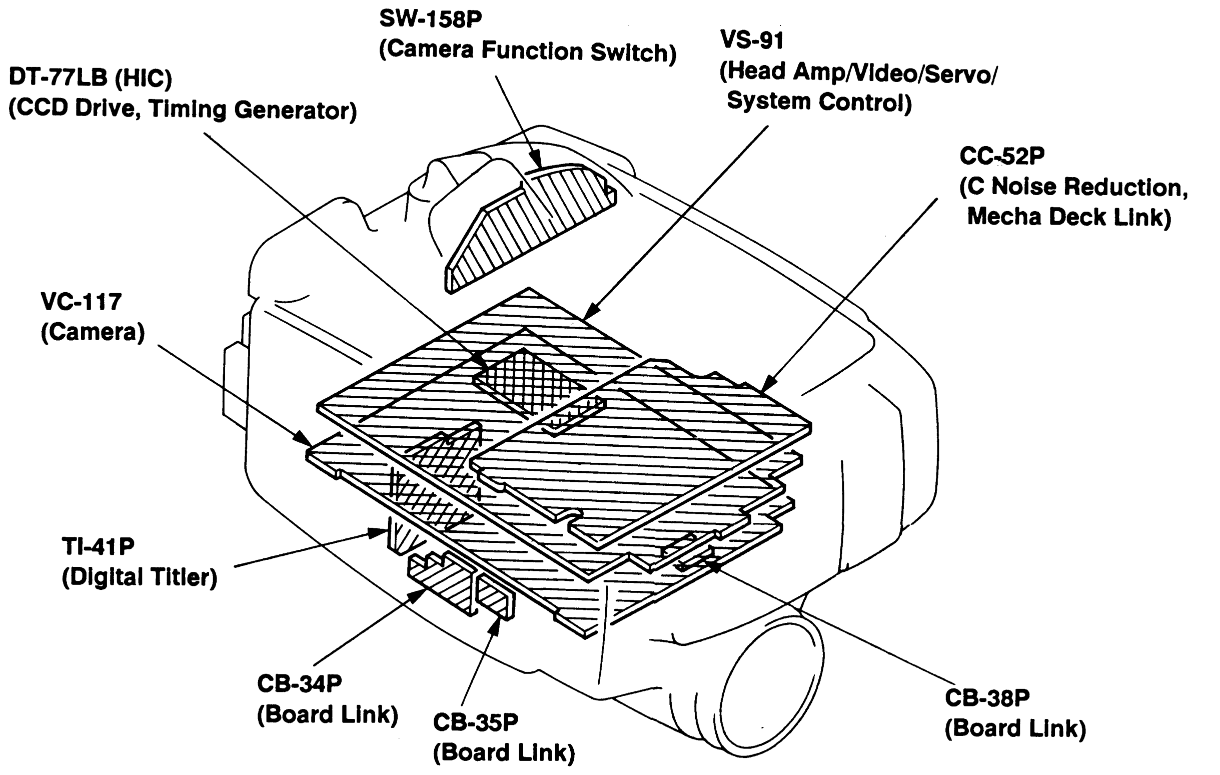
S reel table assembly
X-3728-851-1

M903
Loading motor assembly
A-7040-208-A

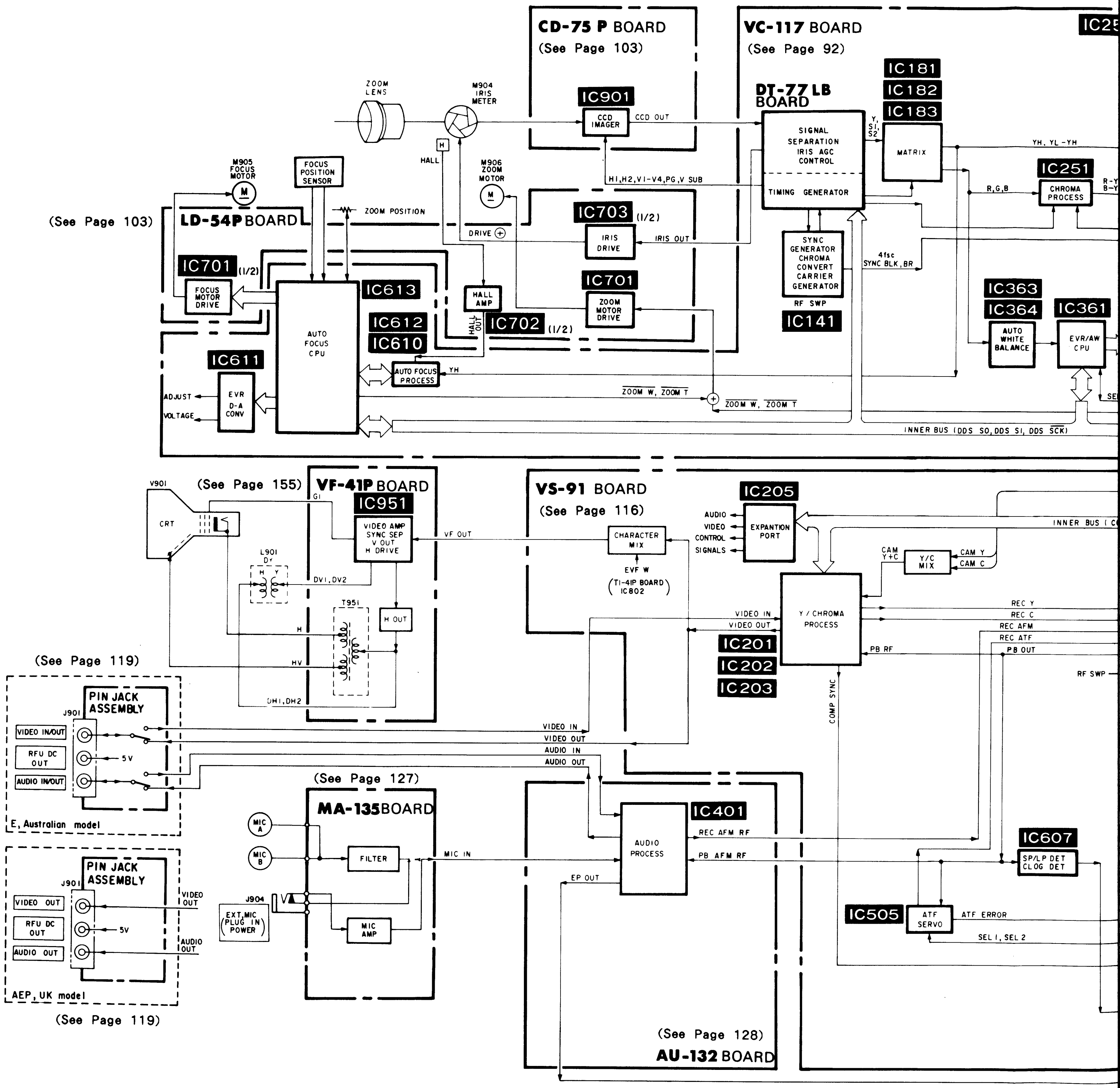
SECTION 3
DIAGRAMS

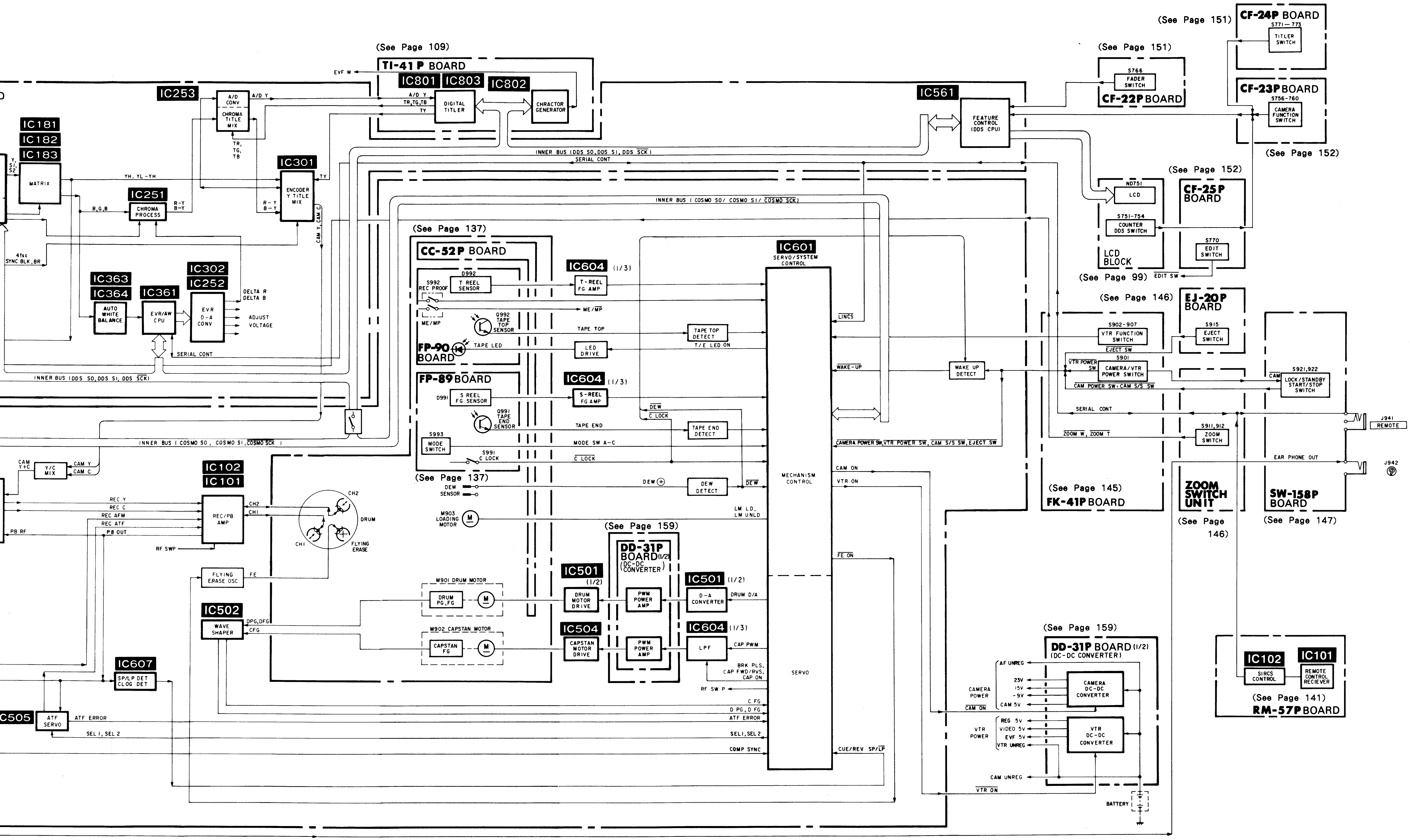
3-1. CIRCUIT BOARDS LOCATION


LCD BLOCK
CD-75P
(CCD Imager)
JC-10P
(Board Link)
CF-25P
(Camera Function Switch)
ZOOM SWITCH UNIT
PIN JACK ASSY
(Terminal)
FK-41P
(VTR Function Switch)
CF-24P
(Camera Function Switch)
VF-41P
(Viewfinder)
DD-31P
(Power)
MA-135
(Mic Amp)
CB-39P
(Board Link)
RM-57P
(Remote Control Receiver)
LD-54P
(Iris/Focus/
Zoom Motor Drive)
EJ-20P
(Eject Switch)
CF-23P
(Camera Function Switch)
AU-132
(Audio)
CF-22P
(Camera Function Switch)

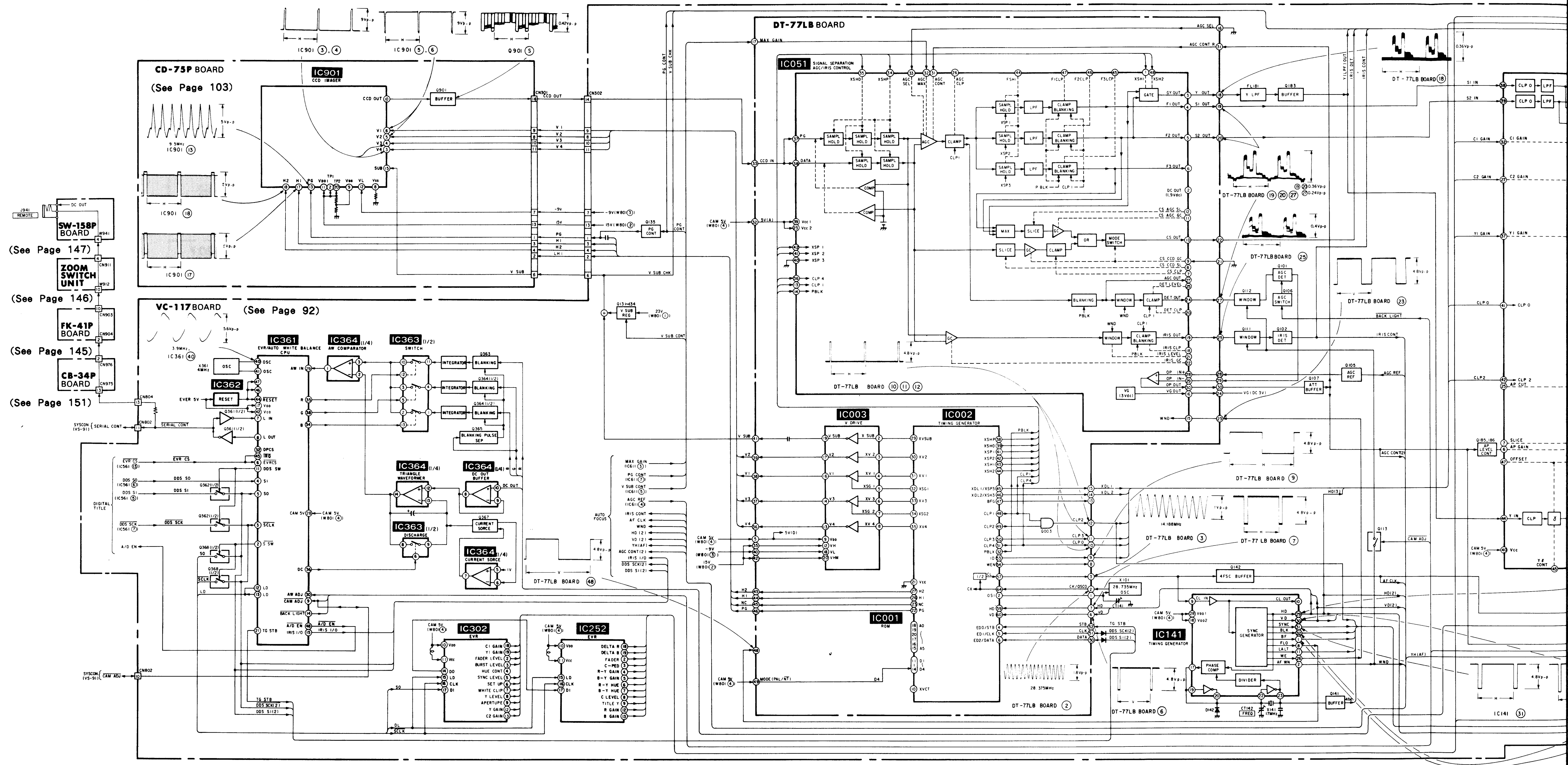

SW-158P
(Camera Function Switch)
DT-77LB (HIC)
(CCD Drive, Timing Generator)
VS-91
(Head Amp/Video/Servo/
System Control)
CC-52P
(C Noise Reduction,
Mecha Deck Link)
VC-117
(Camera)
TI-41P
(Digital Titler)
CB-34P
(Board Link)
CB-35P
(Board Link)
CB-38P
(Board Link)

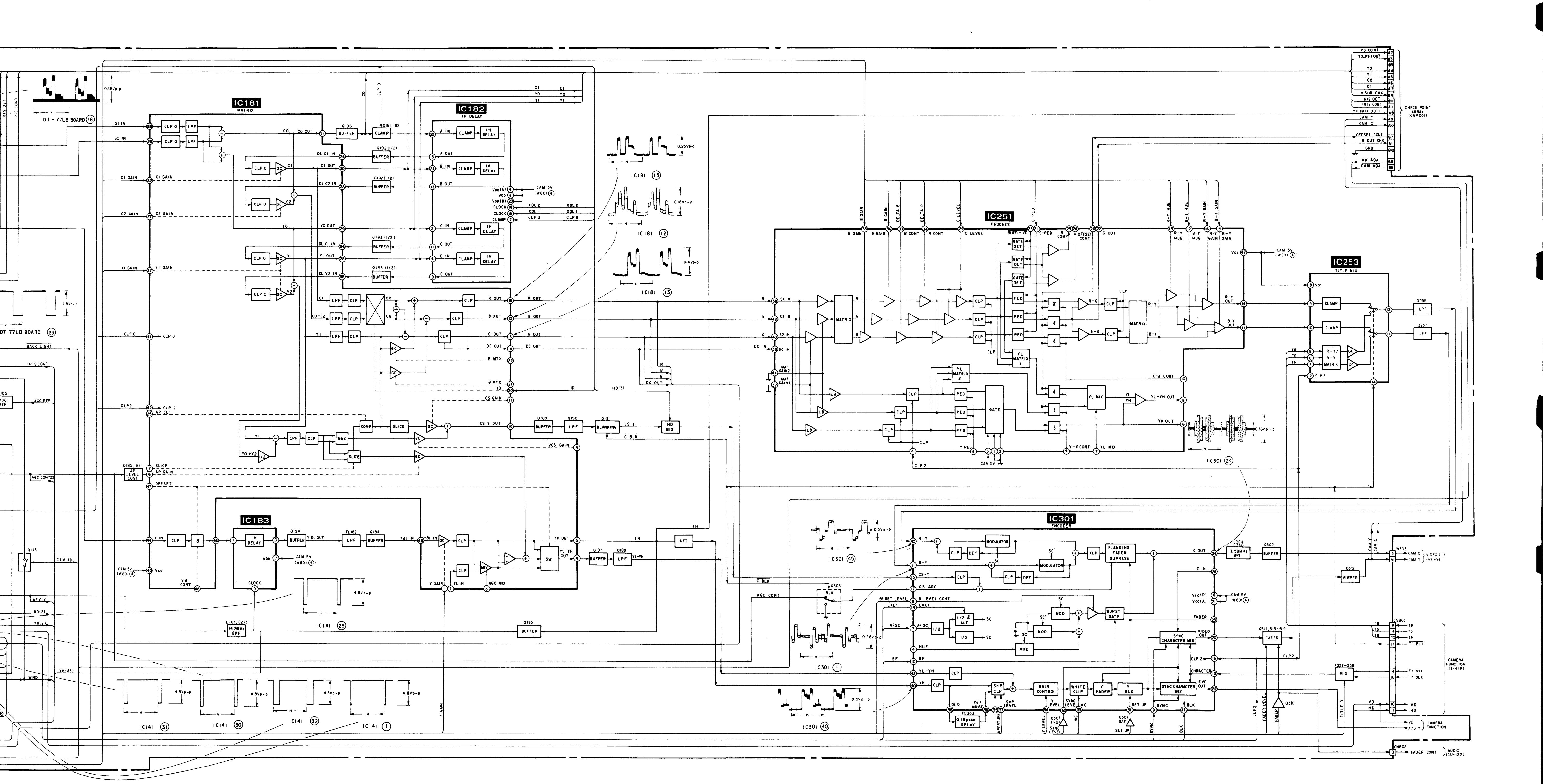
3-2. OVERALL BLOCK DIAGRAM


CD-75 P BOARD
(See Page 103)
IC901
CCD IMAGER
CCD OUT
H1,H2,V1-V4,PG,V SUB
VC-117 BOARD
(See Page 92)
DT-77 LB BOARD
IC181
IC182
IC183
SIGNAL SEPARATION IRIS AGC CONTROL
TIMING GENERATOR
MATRIX
Y, S1, S2
YH, YL-YH
IC251
CHROMA PROCESS
R,G,B
R-Y
B-Y
SYNC GENERATOR CHROMA CONVERT CARRIER GENERATOR
RF SWP
IC141
4fsc
SYNC BLK, BR
IC363
IC364
IC361
AUTO WHITE BALANCE
EVR/AW CPU
INNER BUS (DDS SO, DDS SI, DDS SCK)
ZOOM LENS
M904 IRIS METER
HALL
H
M905 FOCUS MOTOR
M
FOCUS POSITION SENSOR
M906 ZOOM MOTOR
ZOOM POSITION
DRIVE
(See Page 103)
LD-54P BOARD
IC701 (1/2)
FOCUS MOTOR DRIVE
IC703 (1/2)
IRIS DRIVE
IRIS OUT
IC701
ZOOM MOTOR DRIVE
HALL AMP
HALL OUT
IC702 (1/2)
IC613
IC612
IC610
AUTO FOCUS CPU
AUTO FOCUS PROCESS
YH
IC611
EVR D-A CONV
ADJUST
VOLTAGE
ZOOM W, ZOOM T
V901
CRT
(See Page 155)
VF-41P BOARD
IC951
VIDEO AMP SYNC SEP V OUT H DRIVE
VF OUT
G1
L901 DY
H V
DV1, DV2
T951
H OUT
H
HV
DH1, DH2
VS-91 BOARD
(See Page 116)
CHARACTER MIX
EVF W
(TI-41P BOARD IC802)
IC205
EXPANTION PORT
AUDIO
VIDEO
CONTROL
SIGNALS
INNER BUS
CAM Y+C
Y/C MIX
CAM Y
CAM C
Y/CHROMA PROCESS
VIDEO IN
VIDEO OUT
IC201
IC202
IC203
REC Y
REC C
REC AFM
REC ATF
PB RF
PB OUT
RF SWP
COMP SYNC
(See Page 119)
PIN JACK ASSEMBLY
J901
VIDEO IN/OUT
RFU DC OUT
AUDIO IN/OUT
5V
E, Australian model
VIDEO IN
VIDEO OUT
AUDIO IN
AUDIO OUT
PIN JACK ASSEMBLY
J901
VIDEO OUT
RFU DC OUT
AUDIO OUT
5V
VIDEO OUT
AUDIO OUT
AEP, UK model
(See Page 119)
(See Page 127)
MA-135 BOARD
MIC A
MIC B
FILTER
MIC IN
J904
EXT, MIC (PLUG IN POWER)
MIC AMP
IC401
AUDIO PROCESS
REC AFM RF
PB AFM RF
EP OUT
IC607
SP/LP DET CLOG DET
IC505
ATF SERVO
ATF ERROR
SEL 1, SEL 2
(See Page 128)
AU-132 BOARD

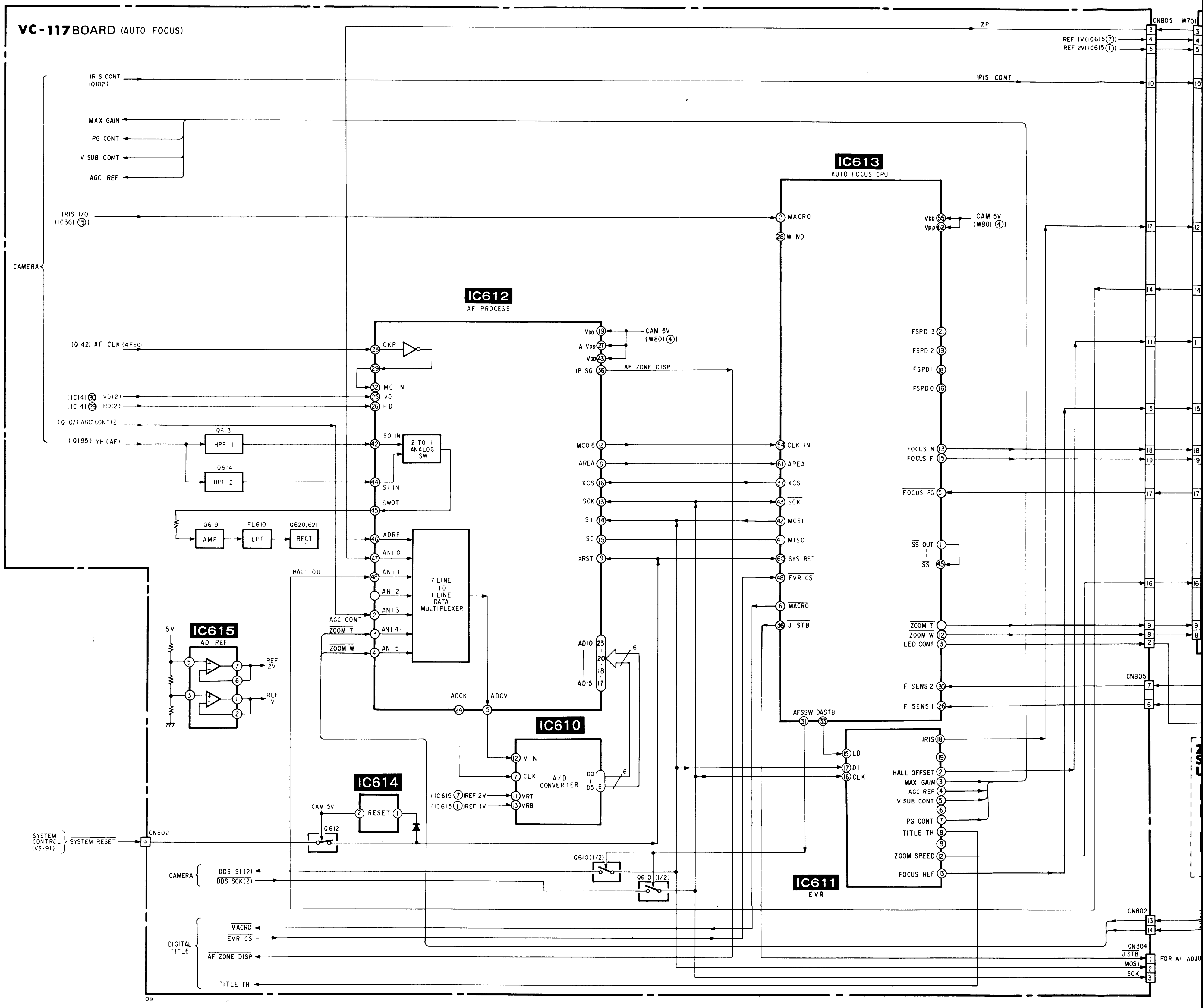

(See Page 109)
TI-41P BOARD
IC801 IC803 IC802
DIGITAL TITLER
CHRACTOR GENERATOR
EVF W
A/D Y
TR,TG,TB
TY
IC253
A/D CONV
CHROMA TITLE MIX
IC181
IC182
IC183
MATRIX
YH, YL-YH
IC301
ENCODER Y TITLE MIX
IC251
CHROMA PROCESS
R,G,B
R-Y B-Y
4fsc SYNC BLK,BR
IC363
IC364
AUTO WHITE BALANCE
IC361
EVR/AW CPU
IC302
IC252
EVR D-A CONV
DELTA R
DELTA B
ADJUST VOLTAGE
SERIAL CONT
INNER BUS (DDS SO,DDS SI, DDS SCK)
INNER BUS (COSMO SO, COSMO SI,COSMO SCK)
CAM Y+C
Y/C MIX
CAM Y
CAM C
IC102
IC101
REC/PB AMP
REC Y
REC C
REC AFM
REC ATF
PB RF
PB OUT
RF SWP
CH2
CH1
DRUM
FLYING ERASE
FLYING ERASE OSC
FE
IC502
WAVE SHAPER
DPG,DFG
CFG
IC607
SP/LP DET CLOG DET
IC505
ATF SERVO
ATF ERROR
SEL 1, SEL 2
(See Page 137)
CC-52P BOARD
S992 REC PROOF
D992
T REEL SENSOR
ME/MP
Q992 TAPE TOP SENSOR
TAPE TOP
TAPE LED
FP-90 BOARD
FP-89 BOARD
D991
S REEL FG SENSOR
Q991 TAPE END SENSOR
TAPE END
S993 MODE SWITCH
MODE SW A-C
S991 C LOCK
C LOCK
(See Page 137)
DEW SENSOR
M903 LOADING MOTOR
IC604 (1/3)
T-REEL FG AMP
S-REEL FG AMP
TAPE TOP DETECT
T/E LED ON
LED DRIVE
TAPE END DETECT
DEW
DEW DETECT
LM LD, LM UNLD
M901 DRUM MOTOR
DRUM PG,FG
M902 CAPSTAN MOTOR
CAPSTAN FG
(See Page 159)
DD-31P BOARD(1/2) (DC-DC CONVERTER)
IC501 (1/2)
DRUM MOTOR DRIVE
PWM POWER AMP
D-A CONVERTER
DRUM D/A
IC504
CAPSTAN MOTOR DRIVE
LPF
CAP PWM
BRK PLS, CAP FWD/RVS, CAP ON
RF SW P
C FG
D PG, D FG
ATF ERROR
SEL1,SEL2
COMP SYNC
IC601
SERVO/SYSTEM CONTROL
MECHANISM CONTROL
SERVO
LINCS
WAKE-UP
CAMERA POWER SW,VTR POWER SW, CAM S/S SW,EJECT SW
CAM ON
VTR ON
FE ON
CUE/REV SP/LP
INNER BUS (DDS SO,DDS SI, DDS SCK)
SERIAL CONT
INNER BUS (COSMO SO/ COSMO SI/ COSMO SCK)
IC561
FEATURE CONTROL (DDS CPU)
WAKE UP DETECT
(See Page 151)
S766 FADER SWITCH
CF-22P BOARD
(See Page 151)
CF-24P BOARD
S771-773 TITLER SWITCH
CF-23P BOARD
S756-760 CAMERA FUNCTION SWITCH
(See Page 152)
ND751 LCD
S751-754 COUNTER DDS SWITCH
LCD BLOCK
(See Page 99)
(See Page 152)
CF-25P BOARD
S770 EDIT SWITCH
EDIT SW
(See Page 146)
EJ-20P BOARD
S915 EJECT SWITCH
S902-907 VTR FUNCTION SWITCH
EJECT SW
S901 CAMERA/VTR POWER SWITCH
VTR POWER SW
CAM POWER SW, CAM S/S SW
CAM
S921,922 LOCK/STANDBY START/STOP SWITCH
SERIAL CONT
ZOOM W, ZOOM T
S911,912 ZOOM SWITCH
(See Page 145)
FK-41P BOARD
ZOOM SWITCH UNIT
(See Page 146)
SW-158P BOARD
(See Page 147)
J941 REMOTE
EAR PHONE OUT
J942
(See Page 159)
DD-31P BOARD(1/2) (DC-DC CONVERTER)
AF UNREG
CAMERA POWER
23V
15V
-9V
CAM 5V
CAM ON
CAMERA DC-DC CONVERTER
VTR POWER
REG 5V
VIDEO 5V
EVF 5V
VTR UNREG
VTR DC-DC CONVERTER
CAM UNREG
VTR ON
BATTERY
IC102
SIRCS CONTROL
IC101
REMOTE CONTROL RECIEVER
(See Page 141)
RM-57P BOARD

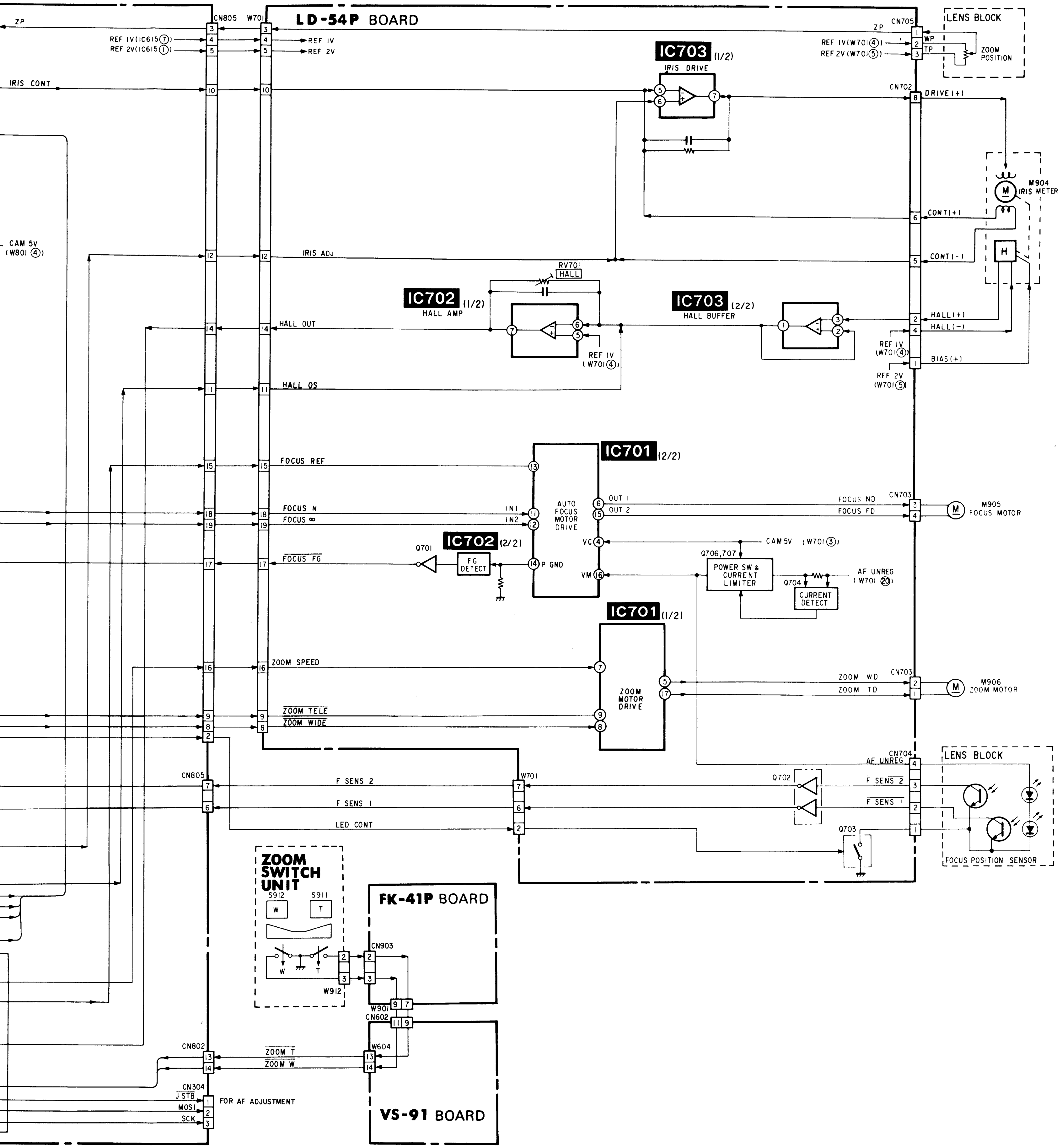
3-3. CAMERA BLOCK DIAGRAM


CD-75P BOARD
(See Page 103)
IC901 CCD IMAGER
Q901 BUFFER
IC901 ③, ④
IC901 ⑤, ⑥
Q901 ⑤
IC901 ⑬
IC901 ⑱
IC901 ⑰
SW-158P BOARD
(See Page 147)
J941 REMOTE
ZOOM SWITCH UNIT
(See Page 146)
FK-41P BOARD
(See Page 145)
CB-34P BOARD
(See Page 151)
VC-117 BOARD
(See Page 92)
IC361 EVR/AUTO WHITE BALANCE CPU
IC362 RESET
IC364 (1/4) AW COMPARATOR
IC363 (1/2) SWITCH
INTEGRATOR
BLANKING
BLANKING PULSE SEP
IC364 (1/4) TRIANGLE WAVEFORMER
IC364 (1/4) DC OUT BUFFER
IC363 (1/2) DISCHARGE
CURRENT SORCE
IC364 (1/4) CURRENT SORCE
IC302 EVR
IC252 EVR
IC361 ㊵
SYSCON (VS-91) SERIAL CONT
SYSCON (VS-91) CAM ADJ
DIGITAL TITLE
AUTO FOCUS
DT-77LB BOARD
IC051 SIGNAL SEPARATION AGC/IRIS CONTROL
SAMPL HOLD
AGC
CLAMP
LPF
CLAMP BLANKING
GATE
MAX
SLICE
OR
MODE SWITCH
WINDOW
IRIS DET
AGC DET
AGC SWITCH
AGC REF
ATT BUFFER
Q113 V SUB REG
Y LPF
BUFFER
IC003 V DRIVE
IC002 TIMING GENERATOR
IC001 ROM
IC141 TIMING GENERATOR
SYNC GENERATOR
PHASE COMP
DIVIDER
4FSC BUFFER
X101 28.735MHz OSC
X141 17MHz
Q141 BUFFER
Q185, 186 AP LEVEL CONT
DT-77LB BOARD ⑱
DT-77LB BOARD ⑲ ⑳ ㉗
DT-77LB BOARD ㉕
DT-77LB BOARD ㉓
DT-77LB BOARD ⑩ ⑪ ⑫
DT-77LB BOARD ⑨
DT-77LB BOARD ③
DT-77LB BOARD ⑦
DT-77LB BOARD ②
DT-77LB BOARD ⑥
DT-77LB BOARD ㊽
IC141 ㉛
14.318MHz
28.375MHz

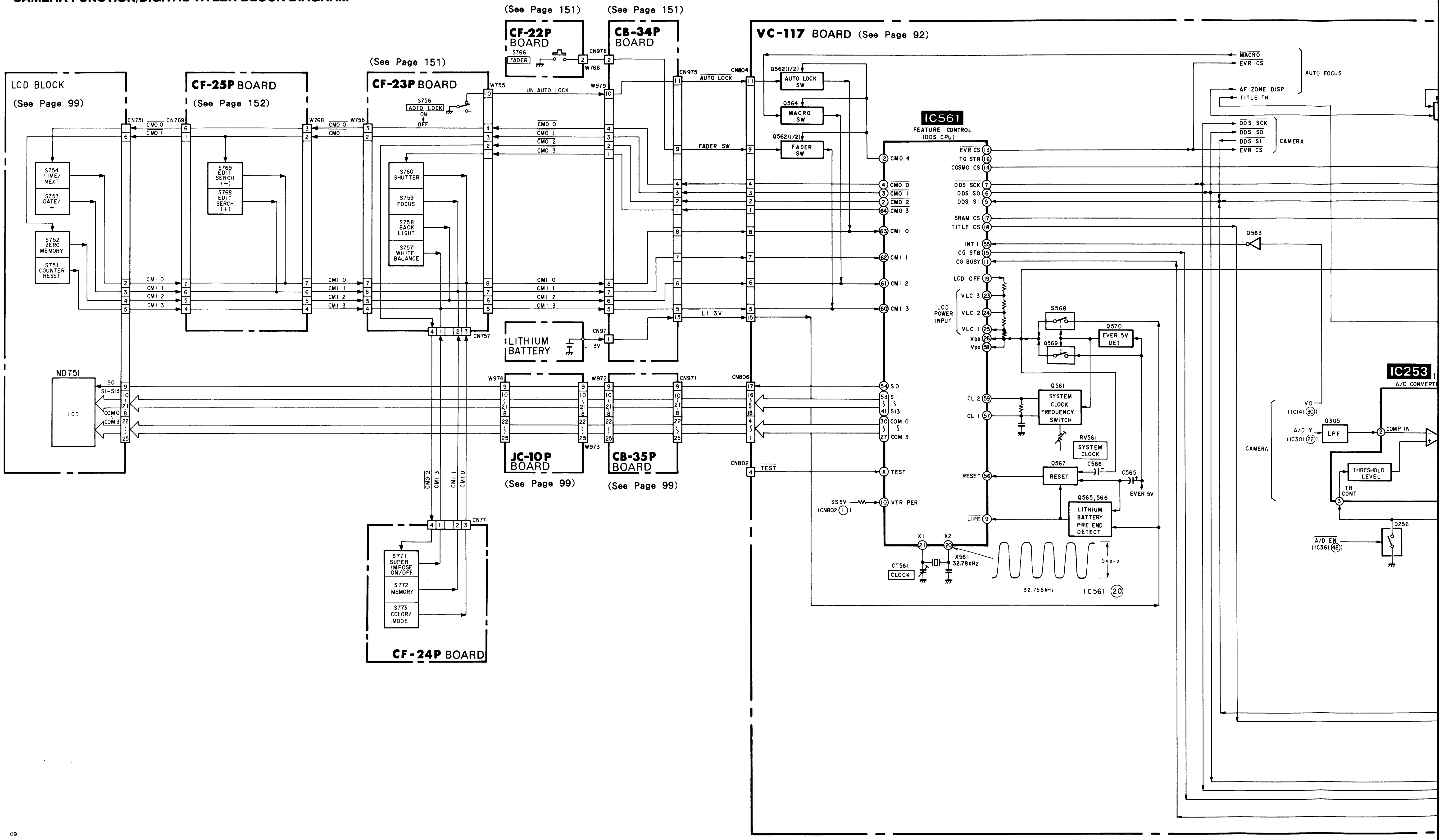

IC181
MATRIX
IC182
1H DELAY
IC183
IC251
PROCESS
IC253
TITLE MIX
IC301
ENCODER
DT-77LB BOARD ⑱
DT-77LB BOARD ㉓
0.36Vp-p
S1 IN
S2 IN
C1 GAIN
C2 GAIN
Y1 GAIN
CLP O
CLP 2
BACK LIGHT
IRIS CONT
AGC REF
AGC CONT(2)
CAM ADJ
AF CLK
HD(2)
VD(2)
YH(AF)
WND
Q113
Q185,186
AP LEVEL CONT
SLICE
AP GAIN
OFFSET
AP CUT
CO OUT
DL C1 IN
C1 OUT
DL C2 IN
YO OUT
DL Y1 IN
Y1 OUT
DL Y2 IN
Q196
BUFFER
Q181,182
CLAMP
Q192(1/2)
Q193(1/2)
A IN
A OUT
B IN
B OUT
C IN
C OUT
D IN
D OUT
1H DELAY
Vdd(A)
Vbb
Vdd(D)
CLOCK
CAM 5V (W801 ④)
XDL 2
XDL 1
CLP 3
R OUT
B OUT
G OUT
DC OUT
R MTX
B MTX
ID
CS GAIN
CS Y OUT
VCS GAIN
HD(3)
Q189
Q190
Q191
LPF
BLANKING
CS Y
C BLK
HD MIX
COMP
SLICE
MAX
Y IN
Yγ CONT
Q194
Y DL OUT
FL182
Q184
Yβ IN
YL IN
Y GAIN
AGC MIX
YL-YH OUT
YH OUT
SW
Q187
Q188
YL-YH
YH
ATT
L183, C233
14.2MHz BPF
Q195
0.25Vp-p
IC181 ⑮
0.18Vp-p
IC181 ⑫
0.4Vp-p
IC181 ⑬
4.8Vp-p
IC141 ㉙
IC141 ㉛
IC141 ㉚
IC141 ㉜
IC141 ①
B GAIN
R GAIN
DELTA B
DELTA R
C LEVEL
C PED
B CONT
R CONT
WND+VD
R COMP
OFFSET CONT
G OUT
R-Y HUE
B-Y HUE
R-Y GAIN
B-Y GAIN
S1 IN
S3 IN
S2 IN
DC IN
MAT GAIN2
MAT GAIN1
MATRIX
GATE DET
PED
CLP
YL MATRIX 1
YL MATRIX 2
GATE
YL MIX
YL-YH OUT
YH OUT
C-γ CONT
Y-γ CONT
Y PED
CAM 5V
CLP 2
R-G
B-G
R-Y
B-Y
R-Y OUT
B-Y OUT
0.76Vp-p
IC301 ㉔
Vcc
CLAMP
R-Y/B-Y MATRIX
TR
TG
TB
Q255
Q257
PG CONT
Y(LPF) OUT
YO
Y1
CO
C1
V SUB CHK
IRIS DET
IRIS CONT
YH (MIX OUT)
CAM Y
CAM C
OFFSET CONT
G OUT CHK
GND
AW ADJ
CAM ADJ
CHECK POINT ARRAY (CP001)
0.5Vp-p
IC301 ㊺
Q303
BLK
AGC CONT
0.28Vp-p
IC301 ①
IC301 ㊵
R-Y
B-Y
CS-Y
CS AGC
B LEVEL CONT
BURST LEVEL
LALT
4FSC
AF SC
1/2
1/2 & ALT
SC
MODULATOR
DET
MOD
HUE
BF
YL-YH
SHP CLP
DLD
DLE NOISE
APERTURE
SHP LEVEL
FL303
0.18μsec DELAY
GAIN CONTROL
WHITE CLIP
Y FADER
Y BLK
Y LEVEL
SYNC LEVEL
WC
Q307 (1/2)
SET UP
SYNC
BLK
BLANKING FADER SUPRESS
BURST GATE
SYNC CHARACTER MIX
VIDEO OUT
EVF OUT
CHARACTER
FADER
C OUT
C IN
Vcc(D)
Vcc(A)
X304
3.58MHz BPF
Q302
BUFFER
Q312
Q311,313-315
FADER
Q310
FADER LEVEL
TITLE Y
R337-338
MIX
CN803
CAM C
CAM Y
VIDEO(1) (VS-91)
TB
TG
TR
YC BLK
TY MIX
TY BLK
VD
HD
CAMERA FUNCTION (TI-41P)
A/D Y
CAMERA FUNCTION
CN802
FADER CONT
AUDIO (AU-132)

3-4. AUTO FOCUS BLOCK DIAGRAM

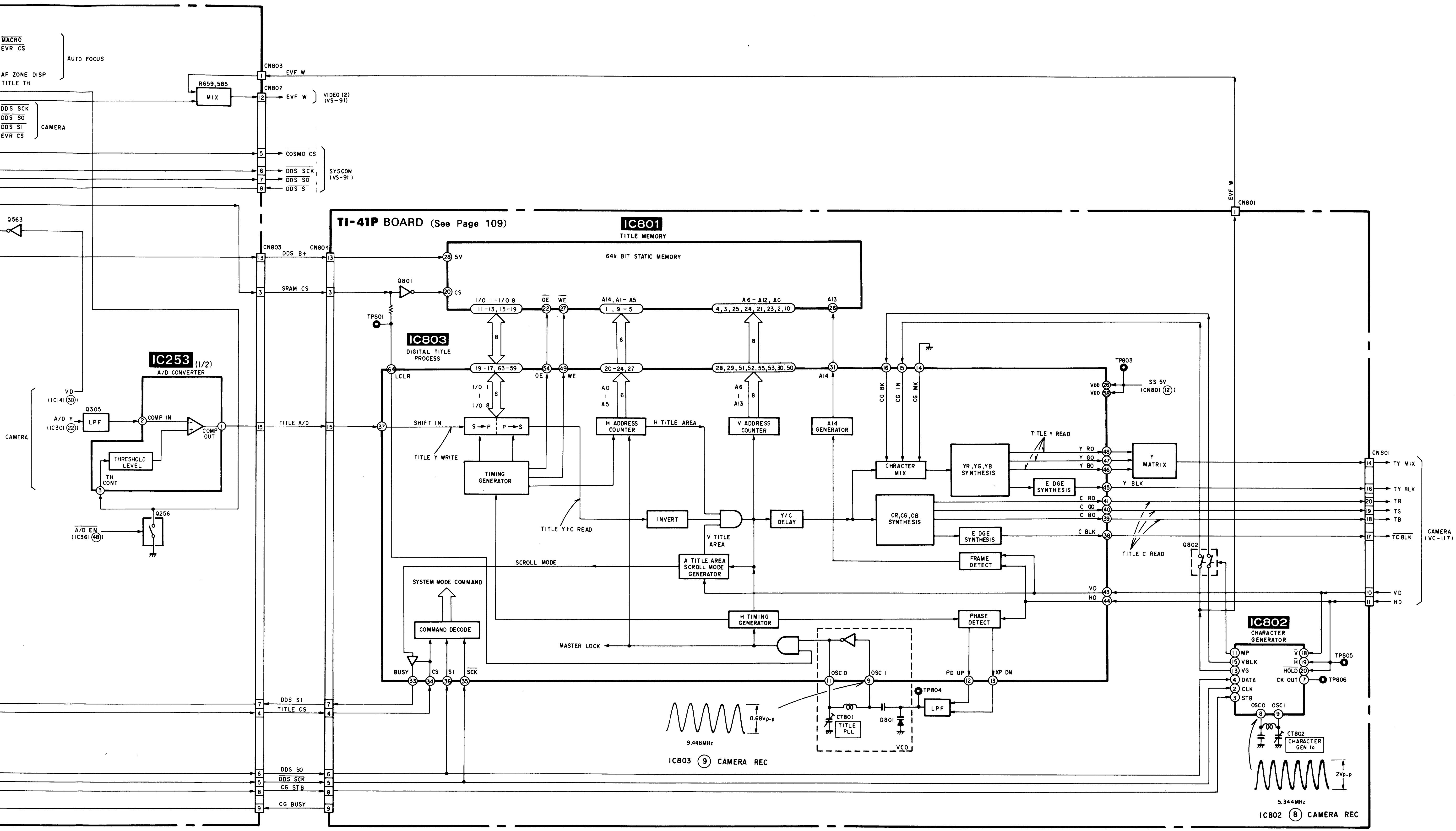

VC-117 BOARD (AUTO FOCUS)
CAMERA
IRIS CONT (Q102)
MAX GAIN
PG CONT
V SUB CONT
AGC REF
IRIS I/O (IC361 ⑮)
(Q142) AF CLK (4FSC)
(IC141 ㉚) VD(2)
(IC141 ㉙) HD(2)
(Q107) AGC CONT(2)
(Q195) YH (AF)
Q613
HPF 1
Q614
HPF 2
Q619
AMP
FL610
LPF
Q620,621
RECT
HALL OUT
AGC CONT
ZOOM T
ZOOM W
IC612
AF PROCESS
CKP
MC IN
VD
HD
SO IN
SI IN
SWOT
ADRF
ANI 0
ANI 1
ANI 2
ANI 3
ANI 4
ANI 5
2 TO 1 ANALOG SW
7 LINE TO 1 LINE DATA MULTIPLEXER
VDD
A VDD
IP SG
CAM 5V (W801 ④)
AF ZONE DISP
MCO 8
AREA
XCS
SCK
SI
SC
XRST
ADIO
ADI5
6
ADCK
ADCV
IC615
AD REF
5V
REF 2V
REF 1V
IC610
V IN
CLK
A/D CONVERTER
VRT
VRB
D0
D5
(IC615 ⑦)REF 2V
(IC615 ①)REF 1V
IC614
RESET
CAM 5V
Q612
SYSTEM CONTROL (VS-91)
SYSTEM RESET
CN802
CAMERA
DDS SI(2)
DDS SCK(2)
Q610(1/2)
Q610 (1/2)
DIGITAL TITLE
MACRO
EVR CS
AF ZONE DISP
TITLE TH
09
IC613
AUTO FOCUS CPU
MACRO
W ND
VDD
Vpp
CAM 5V (W801 ④)
FSPD 3
FSPD 2
FSPD 1
FSPD 0
CLK IN
AREA
XCS
SCK
MOSI
MISO
SYS RST
EVR CS
MACRO
J STB
FOCUS N
FOCUS F
FOCUS FG
SS OUT
SS
ZOOM T
ZOOM W
LED CONT
F SENS 2
F SENS 1
AFSSW
DASTB
IC611
EVR
LD
DI
CLK
IRIS
HALL OFFSET
MAX GAIN
AGC REF
V SUB CONT
PG CONT
TITLE TH
ZOOM SPEED
FOCUS REF
ZP
REF 1V(IC615 ⑦)
REF 2V(IC615 ①)
IRIS CONT
CN805
W701
CN802
CN304
J STB
MOSI
SCK
FOR AF ADJU


LD-54P BOARD
CN805
W701
ZP
REF 1V(IC615⑦)
REF 2V(IC615①)
REF 1V
REF 2V
IRIS CONT
CAM 5V (W801④)
IRIS ADJ
HALL OUT
HALL OS
FOCUS REF
FOCUS N
FOCUS ∞
FOCUS FG
ZOOM SPEED
ZOOM TELE
ZOOM WIDE
IC703 (1/2)
IRIS DRIVE
IC702 (1/2)
HALL AMP
RV701
HALL
IC703 (2/2)
HALL BUFFER
REF 1V (W701④)
REF 2V (W701⑤)
IC701 (2/2)
AUTO FOCUS MOTOR DRIVE
IN1
IN2
OUT 1
OUT 2
P GND
VC
VM
IC702 (2/2)
Q701
FG DETECT
CAM 5V (W701③)
Q706,707
POWER SW & CURRENT LIMITER
Q704
CURRENT DETECT
AF UNREG (W701 ⑳)
IC701 (1/2)
ZOOM MOTOR DRIVE
CN705
LENS BLOCK
WP
TP
ZOOM POSITION
CN702
DRIVE(+)
M904
IRIS METER
CONT(+)
CONT(-)
H
HALL(+)
HALL(-)
BIAS(+)
CN703
FOCUS ND
FOCUS FD
M905
FOCUS MOTOR
ZOOM WD
ZOOM TD
M906
ZOOM MOTOR
CN704
AF UNREG
F SENS 2
F SENS 1
LED CONT
Q702
Q703
LENS BLOCK
FOCUS POSITION SENSOR
ZOOM SWITCH UNIT
S912
S911
W
T
W912
FK-41P BOARD
CN903
W901
CN602
W604
VS-91 BOARD
CN802
ZOOM T
ZOOM W
CN304
J STB
MOSI
SCK
FOR AF ADJUSTMENT

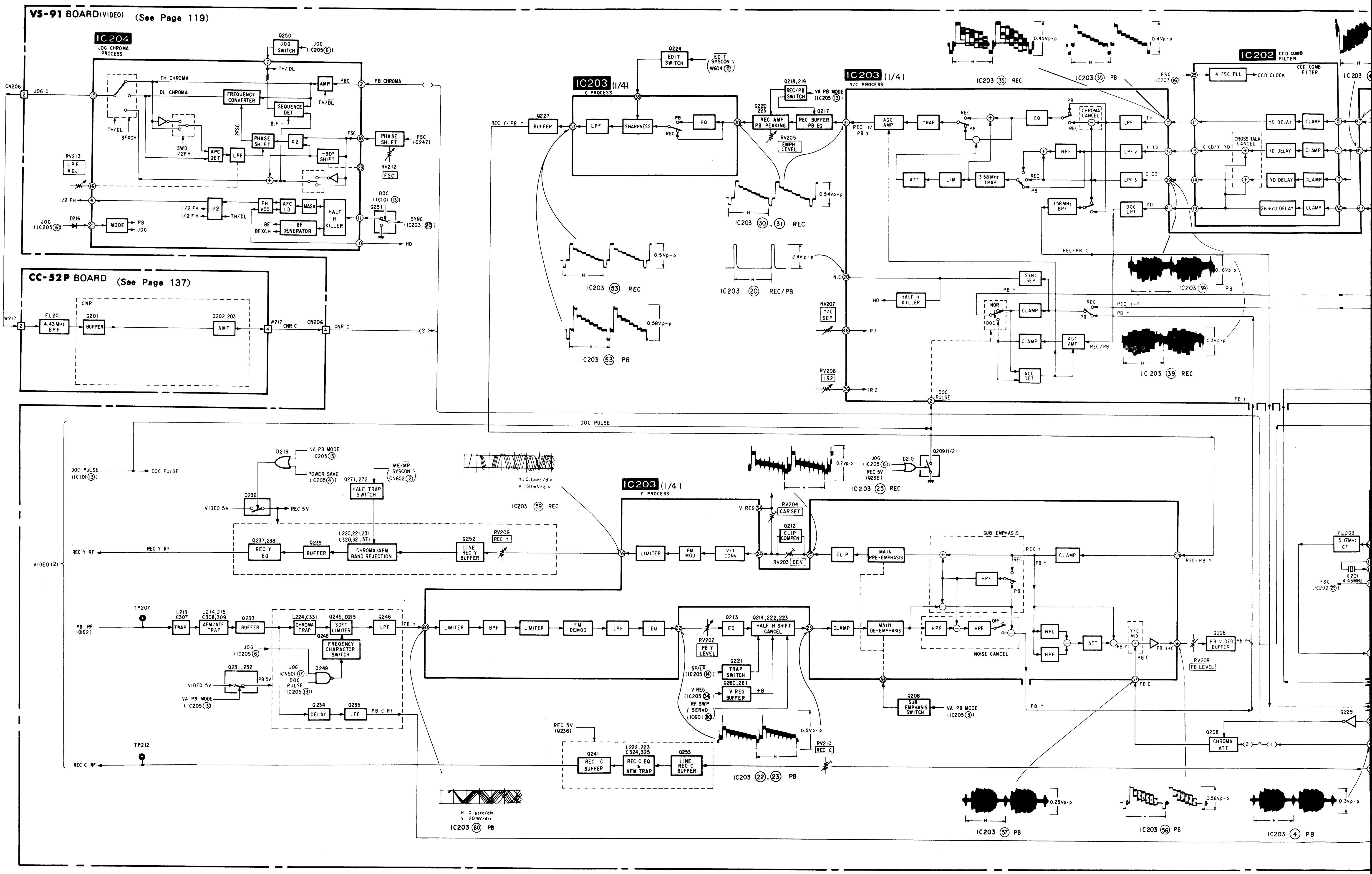
3-5. CAMERA FUNCTION/DIGITAL TITLER BLOCK DIAGRAM

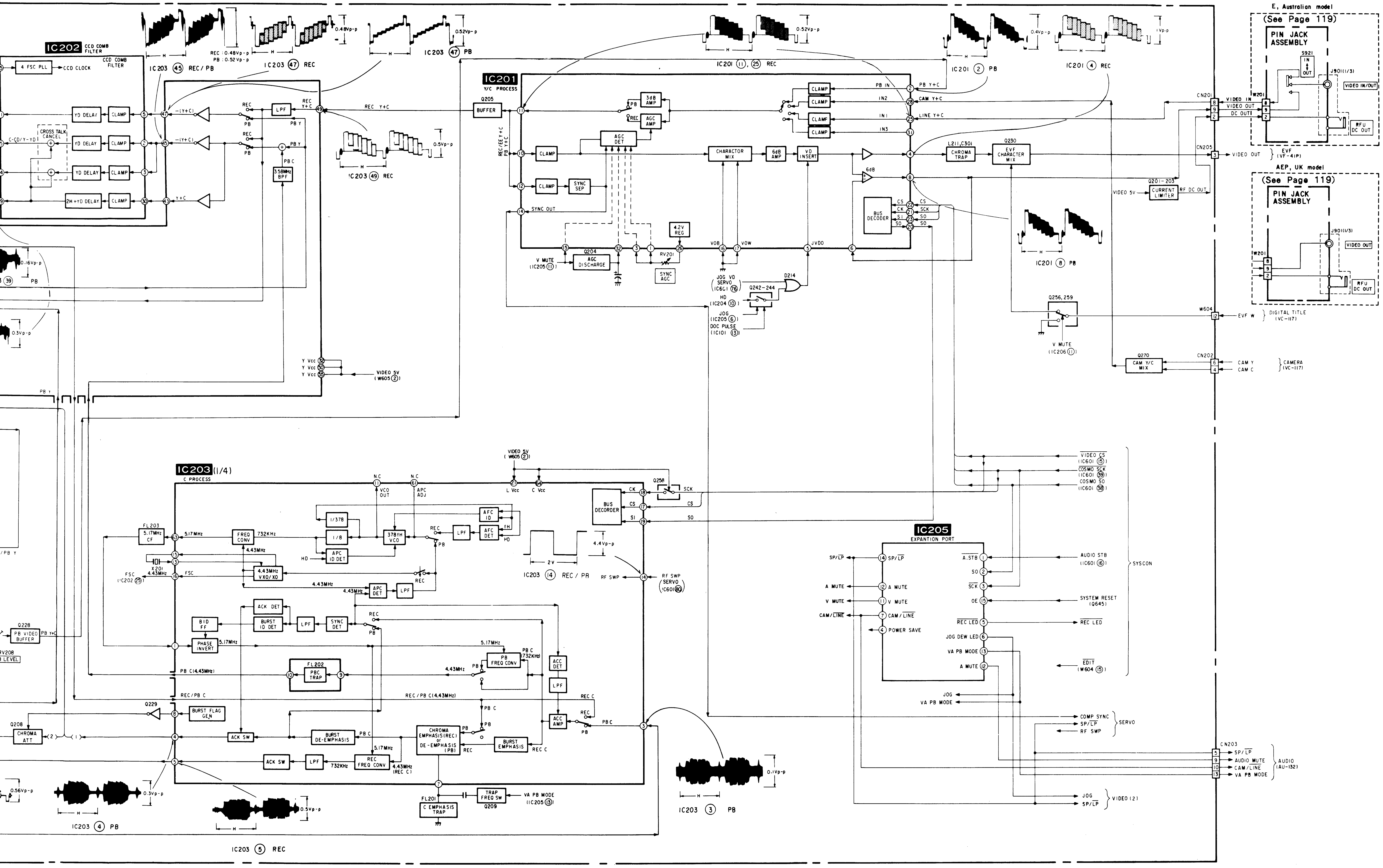

LCD BLOCK
(See Page 99)
S754 TIME/NEXT
S753 DATE/+
S752 ZERO MEMORY
S751 COUNTER RESET
ND751
LCD
SO
S1~S13
COM0
COM3
CN751
CF-25P BOARD
(See Page 152)
CN769
S769 EDIT SERCH (−)
S768 EDIT SERCH (+)
W768
W756
CF-23P BOARD
(See Page 151)
S756 AUTO LOCK ON OFF
S760 SHUTTER
S759 FOCUS
S758 BACK LIGHT
S757 WHITE BALANCE
CN757
W755
UN AUTO LOCK
CMO 0
CMO 1
CMO 2
CMO 3
CMI 0
CMI 1
CMI 2
CMI 3
CF-22P BOARD
(See Page 151)
S766 FADER
CN978
W766
CB-34P BOARD
(See Page 151)
W979
CN975
CN97
LITHIUM BATTERY
LI 3V
W974
W972
W973
CN971
JC-10P BOARD
(See Page 99)
CB-35P BOARD
(See Page 99)
CF-24P BOARD
CN771
S771 SUPER IMPOSE ON/OFF
S772 MEMORY
S773 COLOR/MODE
VC-117 BOARD (See Page 92)
CN804
AUTO LOCK
FADER SW
CN806
CN802
TEST
Q562(1/2) AUTO LOCK SW
Q564 MACRO SW
Q562(1/2) FADER SW
IC561
FEATURE CONTROL (DDS CPU)
CMO 4
EVR CS
TG STB
COSMO CS
DDS SCK
DDS SO
DDS SI
SRAM CS
TITLE CS
INT 1
CG STB
CG BUSY
LCD OFF
LCD POWER INPUT
VLC 3
VLC 2
VLC 1
VDD
S0
S1
S13
COM 0
COM 3
CL 2
CL 1
RESET
LIPE
VTR PER
SS5V (CN802 ①)
X1
X2
CT561 CLOCK
X561 32.78kHz
32.768kHz
5Vp-p
IC561 ⑳
S568
S569
Q570 EVER 5V DET
Q561 SYSTEM CLOCK FREQUENCY SWITCH
RV561 SYSTEM CLOCK
Q567 RESET
C566
C565
EVER 5V
Q565,566 LITHIUM BATTERY PRE END DETECT
Q563
MACRO
EVR CS
AUTO FOCUS
AF ZONE DISP
TITLE TH
DDS SCK
DDS SO
DDS SI
EVR CS
CAMERA
IC253
A/D CONVERT
VD (IC141 ㉚)
A/D Y (IC301 ㉒)
Q305 LPF
COMP IN
THRESHOLD LEVEL
TH CONT
Q256
A/D EN (IC361 ㊽)
CAMERA

09

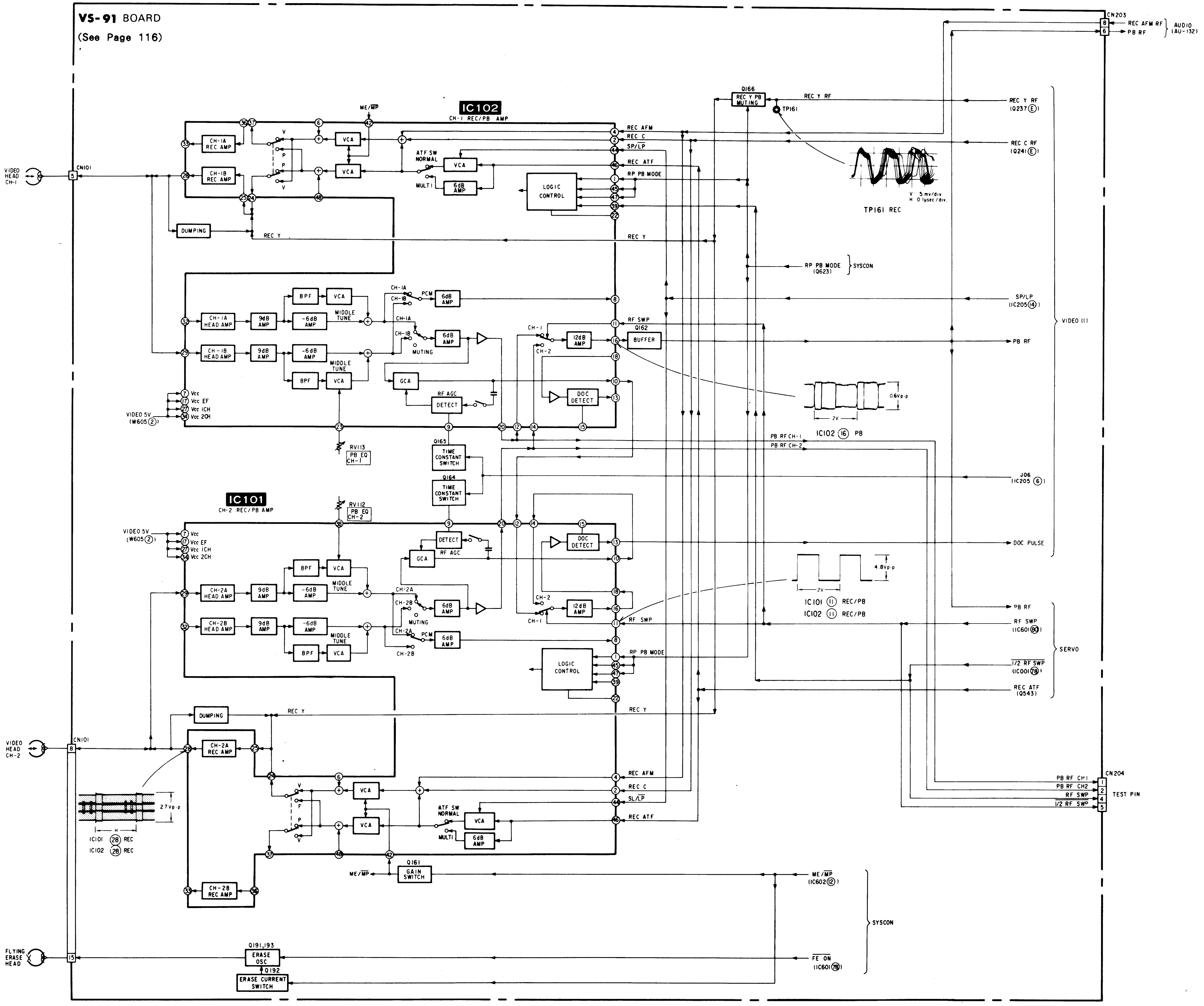

MACRO
EVR CS
AUTO FOCUS
AF ZONE DISP
TITLE TH
DDS SCK
DDS SO
DDS SI
EVR CS
CAMERA
CN803
EVF W
R659,585
MIX
CN802
EVF W
VIDEO (2)
(VS-91)
COSMO CS
DDS SCK
DDS SO
DDS SI
SYSCON
(VS-91)
Q563
CN803
CN801
DDS B+
SRAM CS
TI-41P BOARD (See Page 109)
IC801
TITLE MEMORY
64k BIT STATIC MEMORY
5V
CS
Q801
TP801
I/O 1 - I/O 8
11-13, 15-19
OE
WE
A14, A1 - A5
1, 9-5
A6 - A12, A0
4,3,25,24,21,23,2,10
A13
IC803
DIGITAL TITLE
PROCESS
19-17, 63-59
20-24, 27
28,29,51,52,55,53,30,50
A14
LCLR
I/O 1
I/O 8
A0
A5
A6
A13
IC253 (1/2)
A/D CONVERTER
VD
(IC141 ㉚)
Q305
A/D Y
(IC301 ㉒)
LPF
COMP IN
COMP OUT
THRESHOLD LEVEL
TH CONT
CAMERA
A/D EN
(IC361 ㊽)
Q256
TITLE A/D
SHIFT IN
S→P
P→S
TITLE Y WRITE
TIMING GENERATOR
H ADDRESS COUNTER
H TITLE AREA
V ADDRESS COUNTER
A14 GENERATOR
CG BK
CG IN
CG MK
TP803
VDD
SS 5V
(CN801 ⑫)
TITLE Y READ
CHRACTER MIX
YR, YG, YB SYNTHESIS
Y RO
Y GO
Y BO
Y MATRIX
E DGE SYNTHESIS
Y BLK
TITLE Y+C READ
INVERT
Y/C DELAY
V TITLE AREA
CR, CG, CB SYNTHESIS
C RO
C GO
C BO
E DGE SYNTHESIS
C BLK
TITLE C READ
Q802
SCROLL MODE
A TITLE AREA SCROLL MODE GENERATOR
FRAME DETECT
SYSTEM MODE COMMAND
COMMAND DECODE
VD
HD
H TIMING GENERATOR
PHASE DETECT
MASTER LOCK
BUSY
CS
SI
SCK
OSC O
OSC I
PD UP
XP DN
TP804
LPF
CT801
TITLE PLL
D801
VCO
0.68Vp-p
9.448MHz
IC803 ⑨ CAMERA REC
DDS SI
TITLE CS
DDS SO
DDS SCK
CG STB
CG BUSY
CN801
TY MIX
TY BLK
TR
TG
TB
TC BLK
CAMERA
(VC-117)
VD
HD
EVF W
CN801
IC802
CHARACTER GENERATOR
MP
VBLK
VG
DATA
CLK
STB
V
H
HOLD
CK OUT
TP805
TP806
OSCO
OSCI
CT802
CHARACTER GEN fo
2Vp-p
5.344MHz
IC802 ⑧ CAMERA REC

3-6. VIDEO (1) BLOCK DIAGRAM


VS-91 BOARD(VIDEO) (See Page 119)
IC204
JOG CHROMA PROCESS
Q250 JOG SWITCH
JOG (IC205⑥)
TH/DL
TH CHROMA
DL CHROMA
PBC
PB CHROMA
CN206
JOG C
FREQUENCY CONVERTER
AMP
SEQUENCE DET
PHASE SHIFT
X2
FSC
PHASE SHIFT
FSC (Q247)
-90° SHIFT
TH/DL
BFXCH
SWD1 1/2FH
APC DET
LPF
RV213 LPF ADJ
RV212 FSC
1/2 FH
1/2
FH VCO
AFC ID
MASK
HALF H KILLER
DOC (IC101 ⑬)
Q251
SYNC (IC203 ⑳)
BF
BFXCH
BF GENERATOR
HD
JOG (IC205⑥)
D216
MODE
PB
JOG
CC-52P BOARD (See Page 137)
CNR
W217
FL201 4.43MHz BPF
Q201 BUFFER
Q202,203 AMP
CNR C
Q224 EDIT SWITCH
EDIT SYSCON (W604 ⑮)
IC203 (1/4) C PROCESS
REC Y/PB Y
Q227 BUFFER
LPF
SHARPNESS
EQ
Q218,219 REC/PB SWITCH
VA PB MODE (IC205 ⑬)
Q220 223 REC AMP PB PEAKING
REC BUFFER PB EQ
Q217
RV205 EMPH LEVEL
IC203 (1/4) Y/C PROCESS
REC Y/ PB Y
AGC AMP
TRAP
EQ
CHROMA CANCEL
ATT
LIM
3.58MHz TRAP
HPF
3.58MHz BPF
IC202 CCD COMB FILTER
4 FSC PLL
CCD CLOCK
FSC (IC203 ⑥)
LPF 1
LPF 2
LPF 3
DOC LPF
Y-YD
C-CD
YD
C-CD/Y-YD
CROSS TALK CANCEL
YD DELAY
CLAMP
2H+YD DELAY
0.45Vp-p
0.4Vp-p
IC203 ㉟ REC
IC203 ㉟ PB
0.54Vp-p
IC203 ㉚,㉛ REC
0.5Vp-p
IC203 ㊸ REC
0.58Vp-p
IC203 ㊸ PB
2.4V p-p
IC203 ⑳ REC/PB
RV207 Y/C SEP
RV206 IR2
IR 1
IR 2
HD
HALF H KILLER
SYNC SEP
REC/PB C
0.16Vp-p
IC203 ㊴ PB
NOR
DOC
CLAMP
AGC AMP
AGC DET
REC Y+C
PB Y
0.3Vp-p
IC 203 ㊴ REC
DOC PULSE
DOC PULSE (IC101⑬)
D218
VA PB MODE (IC205⑬)
POWER SAVE (IC205④)
ME/MP SYSCON (CN602 ⑫)
Q271,272 HALF TRAP SWITCH
Q236
VIDEO 5V
REC 5V
H: 0.1µsec/div V: 50mV/div
IC203 ㊾ REC
REC Y RF
VIDEO (2)
Q237,238 REC Y EQ
Q239 BUFFER
L220,221,231 C320,321,371 CHROMA/AFM BAND REJECTION
Q252 LINE REC Y BUFFER
RV209 REC Y
0.7Vp-p
JOG (IC205⑥)
D210
REC 5V (Q236)
Q209(1/2)
IC203 ㉕ REC
IC203 (1/4) Y PROCESS
V REG
RV204 CAR SET
Q212 CLIP COMPEN
LIMITER
FM MOD
V/I CONV
RV203 DEV
CLIP
MAIN PRE-EMPHASIS
SUB EMPHASIS
REC Y
REC/PB Y
HPF
FL203 5.17MHz CF
X201 4.43MHz
FSC (IC202 ㉕)
TP207
PB RF (Q162)
L213 C307 TRAP
L214,215, C308,309 AFM/ATF TRAP
Q233 BUFFER
L224,C331 CHROMA TRAP
Q245,D215 SOFT LIMITER
Q246 LPF
Q248 FREQUENCY CHARACTOR SWITCH
JOG (IC205⑥)
Q231,232
VA PB MODE (IC205⑬)
JOG (CN501⑰)
DOC PULSE (IC205③)
Q249
Q234 DELAY
Q235 LPF
PB C RF
LIMITER
BPF
LIMITER
FM DEMOD
LPF
EQ
RV202 PB Y LEVEL
Q213 EQ
Q214,222,223 HALF H SHIFT CANCEL
Q221 TRAP SWITCH
SP/LP (IC205⑭)
V REG (IC203 ㉞)
Q260,261 V REG BUFFER
+B
RF SWP SERVO (IC601 ㉚)
0.5Vp-p
RV210 REC C
CLAMP
MAIN DE-EMPHASIS
NOISE CANCEL
OFF
HPL
ATT
Y/C MIX
PB Y+C
PB C
Q228 PB VIDEO BUFFER
RV208 PB LEVEL
Q208 SUB EMPHASIS SWITCH
VA PB MODE (IC205⑬)
Q229
Q208 CHROMA ATT
TP212
REC C RF
REC 5V (Q236)
Q241 REC C BUFFER
L222,223 C324,325 REC C EQ & AFM TRAP
Q253 LINE REC C BUFFER
IC203 ㉒,㉓ PB
H: 0.1µsec/div V: 20mV/div
IC203 ㊿ PB
0.25Vp-p
IC203 (57) PB
0.56Vp-p
IC203 (56) PB
0.3Vp-p
IC203 ④ PB


IC202 CCD COMB FILTER
4 FSC PLL
CCD CLOCK
CCD COMB FILTER
YD DELAY
CLAMP
CROSS TALK CANCEL
C-CD/Y-YD
2H+YD DELAY
IC203 (45) REC/PB
IC203 (47) REC
IC203 (47) PB
REC : 0.48Vp-p
PB : 0.52Vp-p
0.48Vp-p
0.52Vp-p
LPF
REC Y+C
PB Y
3.58MHz BPF
PB C
IC203 (49) REC
0.5Vp-p
Y Vcc
VIDEO 5V (W605 (2))
IC201
Y/C PROCESS
Q205 BUFFER
REC Y+C
REC/EE/Y+C PB Y+C
CLAMP
SYNC SEP
SYNC OUT
3dB AMP
AGC AMP
AGC DET
Q204 AGC DISCHARGE
V MUTE (IC205 (11))
RV201 SYNC AGC
4.2V REG
CHARACTOR MIX
6dB AMP
VD INSERT
VOB
VOW
JVDO
JOG VD (SERVO) (IC601 (76))
HD (IC204 (10))
JOG (IC205 (6))
DOC PULSE (IC101 (13))
Q242-244
D214
IC201 (11), (25) REC
0.52Vp-p
IC201 (2) PB
IC201 (4) REC
0.4Vp-p
1Vp-p
PB IN
IN2
IN1
IN3
PB Y+C
CAM Y+C
LINE Y+C
L211,C301 CHROMA TRAP
Q230 EVF CHARACTER MIX
6dB
BUS DECODER
CS
CK
SI
SO
SCK
IC201 (8) PB
Q201-203 CURRENT LIMITER
VIDEO 5V
RF DC OUT
Q256,259
V MUTE (IC206 (11))
Q270 CAM Y/C MIX
CN201
VIDEO IN
VIDEO OUT
DC OUT
CN205
VIDEO OUT
EVF (VF-41P)
W604
EVF W
DIGITAL TITLE (VC-117)
CN202
CAM Y
CAM C
CAMERA (VC-117)
E, Australian model
(See Page 119)
PIN JACK ASSEMBLY
S921 IN OUT
J901(1/3)
VIDEO IN/OUT
W201
RFU DC OUT
AEP, UK model
(See Page 119)
PIN JACK ASSEMBLY
J901(1/3)
VIDEO OUT
W201
RFU DC OUT
IC203 (1/4)
C PROCESS
N.C
VCO OUT
APC ADJ
L Vcc
C Vcc
VIDEO 5V (W605 (2))
Q258
BUS DECORDER
CK
CS
SI
SCK
CS
SO
1/378
1/8
AFC ID
AFC DET
APC ID DET
378fH VCO
LPF
REC
PB
1H
HD
FL203 5.17MHz CF
5.17MHz
FREQ CONV
732KHz
4.43MHz
X201 4.43MHz
FSC (IC202 (25))
4.43MHz VXO/XO
APC DET
4.4Vp-p
2V
IC203 (14) REC/PB
RF SWP
RF SWP (SERVO) (IC601 (80))
ACK DET
BID FF
BURST ID DET
SYNC DET
PHASE INVERT
5.17MHz
PB FREQ CONV
PB C (732KHz)
FL202 PBC TRAP
PB C(4.43MHz)
ACC DET
ACC AMP
REC/PB C
REC/PB C(4.43MHz)
REC C
PB C
PBC
Q228 PB VIDEO BUFFER
PB Y+C
RV208 PB LEVEL
Q229 BURST FLAG GEN
Q208 CHROMA ATT
ACK SW
BURST DE-EMPHASIS
CHROMA EMPHASIS(REC) or DE-EMPHASIS (PB)
BURST EMPHASIS
REC FREQ CONV
4.43MHz (REC C)
732KHz
FL201 C EMPHASIS TRAP
TRAP FREQ SW Q209
VA PB MODE (IC205 (13))
0.56Vp-p
0.3Vp-p
IC203 (4) PB
0.5Vp-p
IC203 (5) REC
0.1Vp-p
IC203 (3) PB
0.16Vp-p
0.3Vp-p
IC205
EXPANTION PORT
SP/LP
A MUTE
V MUTE
CAM/LINE
POWER SAVE
A.STB
SO
SCK
OE
REC LED
JOG DEW LED
VA PB MODE
A MUTE
VIDEO CS (IC601 (15))
COSMO SCK (IC601 (39))
COSMO SO (IC601 (38))
AUDIO STB (IC601 (16))
SYSTEM RESET (Q645)
REC LED
EDIT (W604 (5))
SYSCON
JOG
VA PB MODE
COMP SYNC
SP/LP
RF SWP
SERVO
CN203
SP/LP
AUDIO MUTE
CAM/LINE
VA PB MODE
AUDIO (AU-132)
JOG
SP/LP
VIDEO (2)

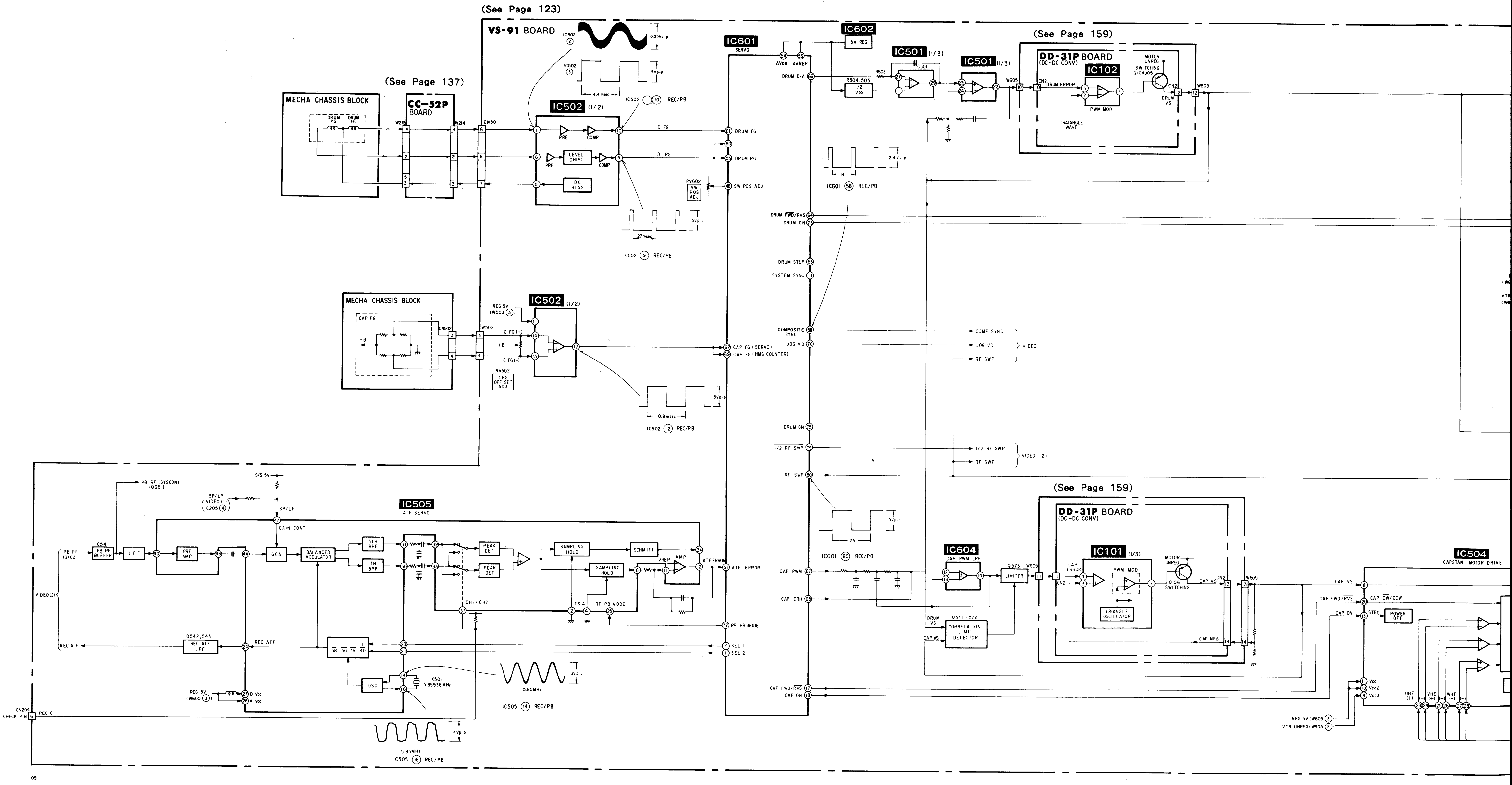
3-7. VIDEO (2) BLOCK DIAGRAM

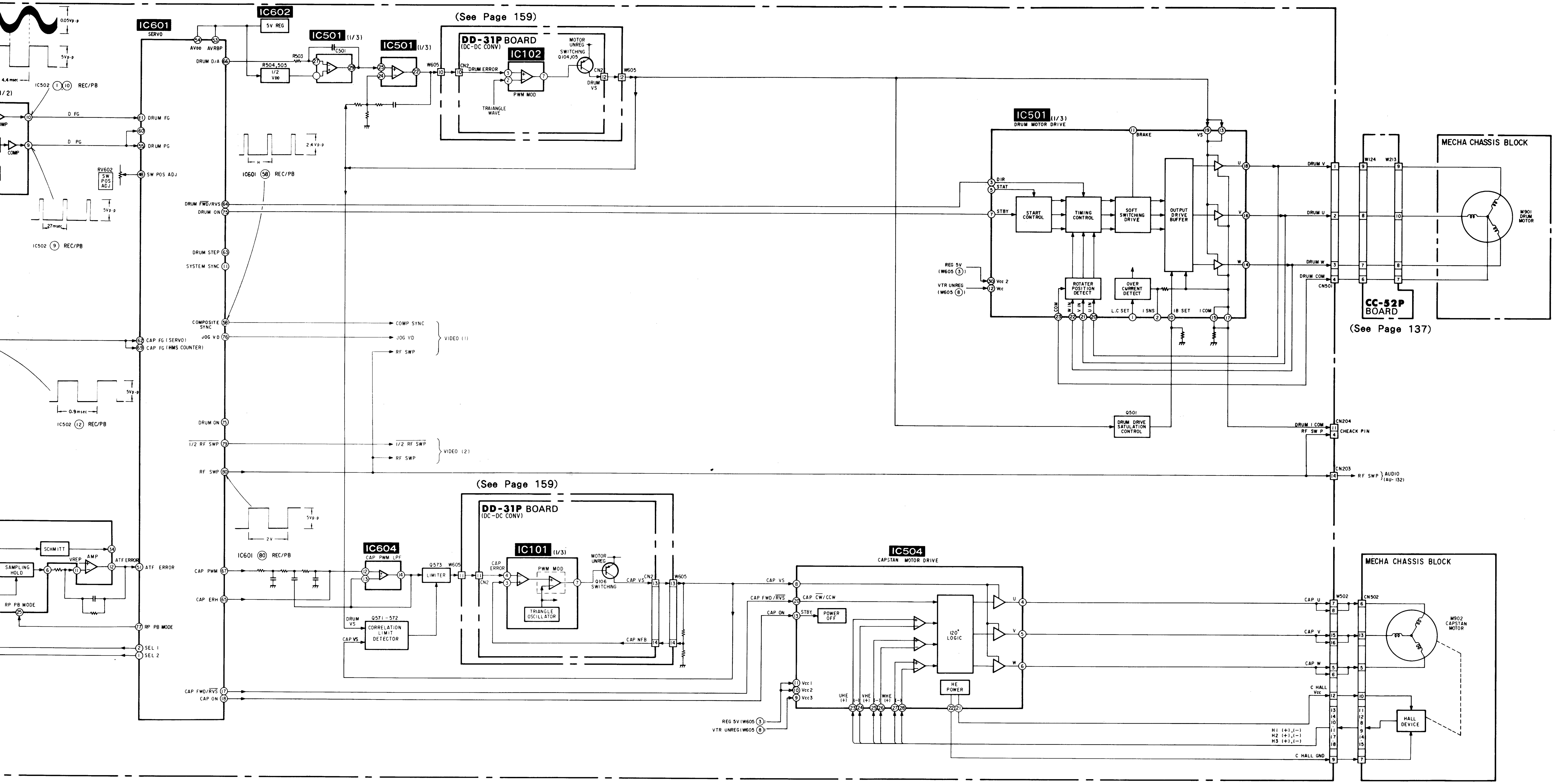

VS-91 BOARD
(See Page 116)
IC102
CH-1 REC/PB AMP
IC101
CH-2 REC/PB AMP
VIDEO HEAD CH-1
VIDEO HEAD CH-2
FLYING ERASE HEAD
CN101
CH-1A REC AMP
CH-1B REC AMP
CH-2A REC AMP
CH-2B REC AMP
CH-1A HEAD AMP
CH-1B HEAD AMP
CH-2A HEAD AMP
CH-2B HEAD AMP
9dB AMP
-6dB AMP
BPF
VCA
MIDDLE TUNE
6dB AMP
12dB AMP
PCM
MUTING
GCA
RF AGC
DETECT
DOC DETECT
LOGIC CONTROL
ATF SW
NORMAL
MULTI
DUMPING
REC Y
ME/MP
Q165 TIME CONSTANT SWITCH
Q164 TIME CONSTANT SWITCH
RV113 PB EQ CH-1
RV112 PB EQ CH-2
VIDEO 5V (W605 ②)
Vcc
Vcc EF
Vcc 1CH
Vcc 2CH
Q166 REC Y PB MUTING
TP161
TP161 REC
V 5mv/div
H 0.1μsec/div.
REC Y RF
REC AFM
REC C
SP/LP
SL/LP
REC ATF
RP PB MODE
RF SWP
Q162 BUFFER
CH-1
CH-2
0.6Vp-p
2V
IC102 ⑯ PB
PB RF CH-1
PB RF CH-2
4.8Vp-p
IC101 ⑪ REC/PB
IC102 ⑪ REC/PB
2.7Vp-p
H
IC101 ㉘ REC
IC102 ㉘ REC
Q161 GAIN SWITCH
Q191,193 ERASE OSC
Q192 ERASE CURRENT SWITCH
CN203
REC AFM RF
PB RF
AUDIO (AU-132)
REC Y RF (Q237 Ⓔ)
REC C RF (Q241 Ⓔ)
RP PB MODE (Q623)
SYSCON
SP/LP (IC205 ⑭)
VIDEO (1)
PB RF
J06 (IC205 ⑥)
DOC PULSE
PB RF
RF SWP (IC601 ㊵)
1/2 RF SWP (IC001 ㊳)
REC ATF (Q543)
SERVO
ME/MP (IC602 ⑫)
FE ON (IC601 ㊷)
SYSCON
CN204
PB RF CH1
PB RF CH2
RF SWP
1/2 RF SWP
TEST PIN

EC AFM RF } AUDIO
B RF (AU-132)

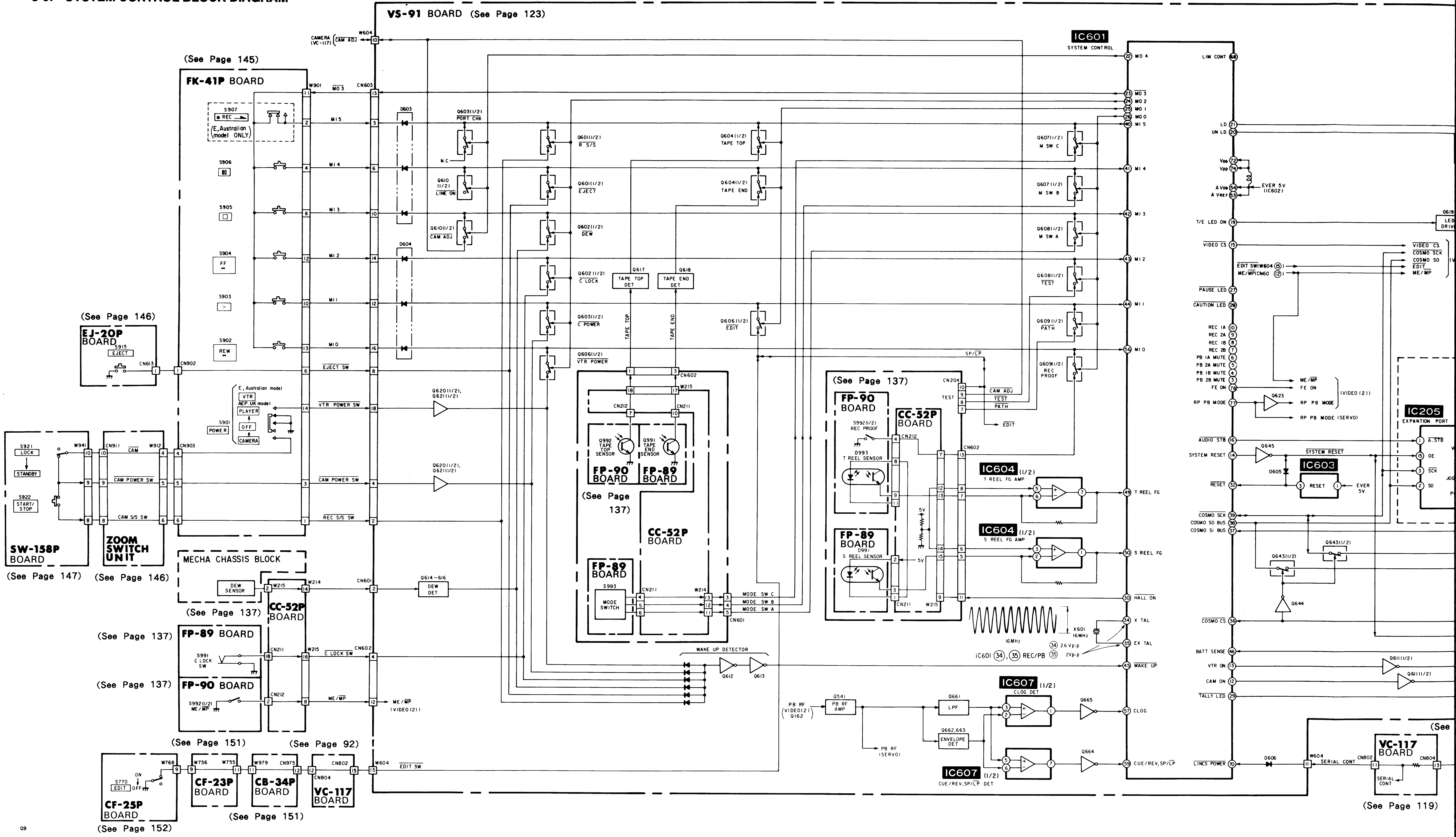
N

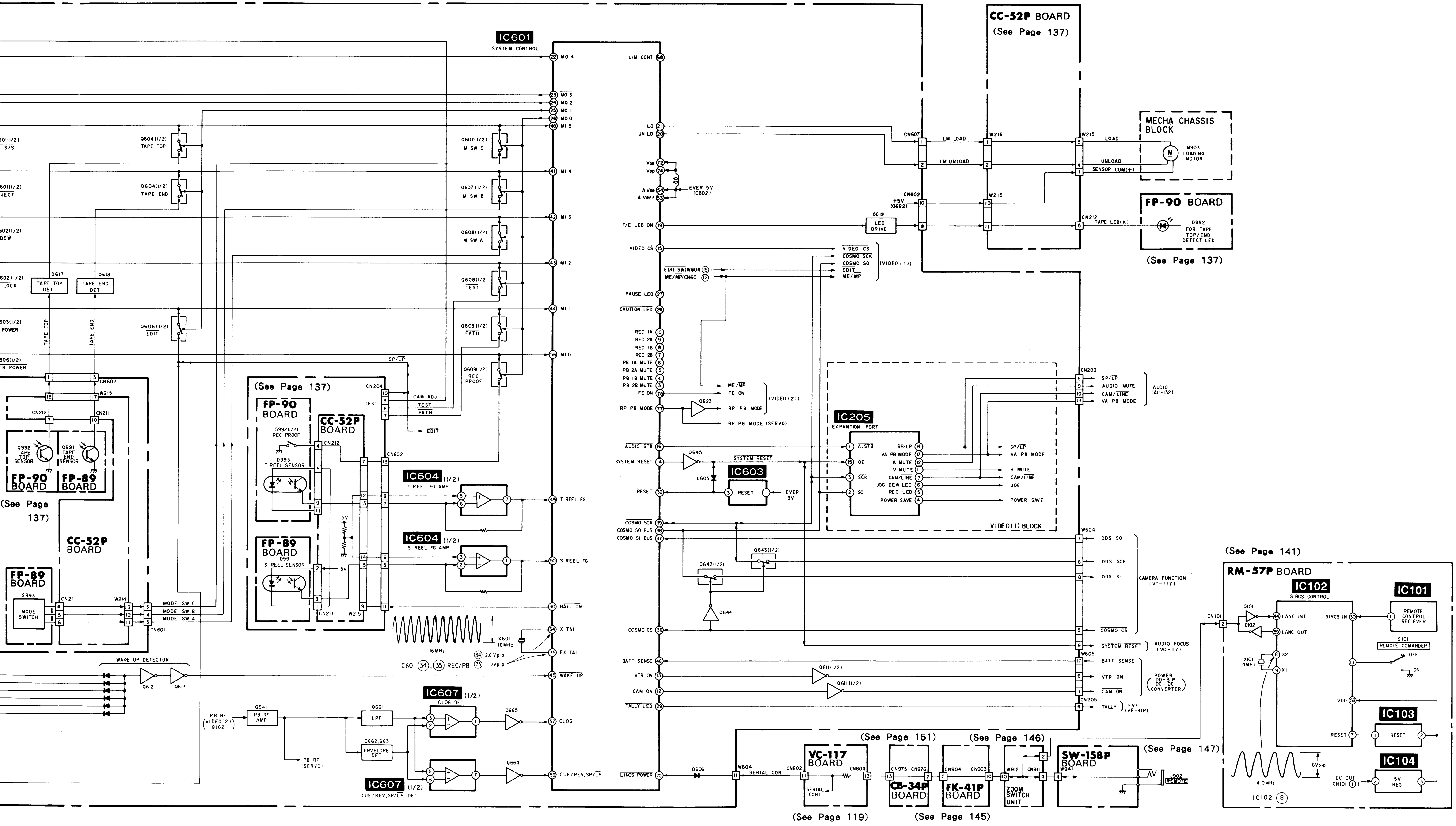
3-8. SERVO BLOCK DIAGRAM


(See Page 123)
VS-91 BOARD
(See Page 137)
MECHA CHASSIS BLOCK
DRUM PG
DRUM FG
CC-52P BOARD
W213
W214
CN501
IC502 (1/2)
PRE
COMP
LEVEL CHIPT
DC BIAS
IC502 ②
0.05Vp-p
IC502 ③
5Vp-p
4.4msec
IC502 ① ⑩ REC/PB
D FG
D PG
5Vp-p
27msec
IC502 ⑨ REC/PB
IC601
SERVO
AVDD AVRBP
DRUM D/A
DRUM FG
DRUM PG
RV602 SW POS ADJ
SW POS ADJ
DRUM FWD/RVS
DRUM ON
DRUM STEP
SYSTEM SYNC
COMPOSITE SYNC
JOG VD
CAP FG (SERVO)
CAP FG (MMS COUNTER)
DRUM ON
1/2 RF SWP
RF SWP
ATF ERROR
RP PB MODE
SEL 1
SEL 2
CAP PWM
CAP ERR
CAP FWD/RVS
CAP ON
2.4Vp-p
H
IC601 ㊳ REC/PB
IC602
5V REG
IC501 (1/3)
C501
R503
R504,505
1/2 VDD
IC501 (1/3)
W605
(See Page 159)
DD-31P BOARD
(DC-DC CONV)
IC102
DRUM ERROR
TRAIANGLE WAVE
PWM MOD
MOTOR UNREG
SWITCHING Q104,105
CN2
DRUM VS
W605
MECHA CHASSIS BLOCK
CAP FG
+B
CN502
W502
REG 5V (W503 ③)
C FG (+)
+B
C FG (−)
RV502 CFG OFF SET ADJ
IC502 (1/2)
5Vp-p
0.9msec
IC502 ⑫ REC/PB
COMP SYNC
JOG VD
RF SWP
VIDEO (1)
1/2 RF SWP
RF SWP
VIDEO (2)
5Vp-p
2V
IC601 ㊿ REC/PB
PB RF (SYSCON) (Q661)
S/S 5V
SP/LP VIDEO (1) (IC205 ④)
SP/LP
IC505
ATF SERVO
GAIN CONT
PB RF (Q162)
Q541 PB RF BUFFER
LPF
PRE AMP
GCA
BALANCED MODULATOR
3fH BPF
fH BPF
PEAK DET
PEAK DET
SAMPLING HOLD
SAMPLING HOLD
SCHMITT
VREP
AMP
CH1/CH2
TS A
RP PB MODE
VIDEO (2)
REC ATF
Q542,543 REC ATF LPF
REC ATF
58 50 36 40
OSC
X501 5.85938MHz
REG 5V (W605 ③)
D Vcc
A Vcc
3Vp-p
5.85MHz
IC505 ⑭ REC/PB
4Vp-p
5.85MHz
IC505 ⑯ REC/PB
CN204 CHECK PIN
REC C
09
(See Page 159)
DD-31P BOARD
(DC-DC CONV)
IC604
CAP PWM LPF
Q573
LIMITER
W605
IC101 (1/3)
CAP ERROR
PWM MOD
TRIANGLE OSCILLATOR
MOTOR UNREG
Q106 SWITCHING
CAP VS
CAP NFB
DRUM VS
CAP VS
Q571-572 CORRELATION LIMIT DETECTOR
IC504
CAPSTAN MOTOR DRIVE
CAP VS
CAP FWD/RVS
CAP CW/CCW
CAP ON
STBY
POWER OFF
Vcc1
Vcc2
Vcc3
REG 5V (W605 ③)
VTR UNREG (W605 ⑧)
UHE (+)
VHE (+)
WHE (+)


IC601
SERVO
IC602
5V REG
IC501 (1/3)
IC501 (1/3)
(See Page 159)
DD-31P BOARD
(DC-DC CONV)
IC102
MOTOR UNREG
SWITCHING Q104,105
DRUM ERROR
PWM MOD
TRAIANGLE WAVE
DRUM VS
CN2
W605
R503
C501
R504,505
1/2 VDD
AVDD
AVRBP
DRUM D/A
0.05Vp-p
5Vp-p
4.4 msec
IC502 ① ⑩ REC/PB
(1/2)
D FG
D PG
COMP
DRUM FG
DRUM PG
RV602 SW POS ADJ
SW POS ADJ
2.4 Vp-p
H
IC601 (58) REC/PB
5Vp-p
27msec
IC502 ⑨ REC/PB
DRUM FWD/RVS
DRUM ON
DRUM STEP
SYSTEM SYNC
COMPOSITE SYNC
JOG VD
COMP SYNC
JOG VD
RF SWP
VIDEO (1)
CAP FG (SERVO)
CAP FG (HMS COUNTER)
5Vp-p
0.9msec
IC502 ⑫ REC/PB
DRUM ON
1/2 RF SWP
RF SWP
1/2 RF SWP
RF SWP
VIDEO (2)
5Vp-p
2V
IC601 (80) REC/PB
SCHMITT
SAMPLING HOLD
VREP
AMP
ATF ERROR
ATF ERROR
RP PB MODE
RP PB MODE
SEL 1
SEL 2
CAP PWM
CAP ERH
CAP FWD/RVS
CAP ON
IC604
CAP PWM LPF
Q573
LIMITER
W605
DRUM VS
CAP VS
Q571-572
CORRELATION LIMIT DETECTOR
(See Page 159)
DD-31P BOARD
(DC-DC CONV)
IC101 (1/3)
CAP ERROR
CN2
PWM MOD
TRIANGLE OSCILLATOR
MOTOR UNREG
Q106 SWITCHING
CAP VS
CAP NFB
W605
IC501 (1/3)
DRUM MOTOR DRIVE
BRAKE
VS
DIR
STAT
STBY
START CONTROL
TIMING CONTROL
SOFT SWITCHING DRIVE
OUTPUT DRIVE BUFFER
ROTATER POSITION DETECT
OVER CURRENT DETECT
REG 5V (W605 ③)
VTR UNREG (W605 ⑧)
Vcc 2
Vcc
COM
W IN
V IN
U IN
L.C SET
I SNS
IB SET
I COM
U
V
W
DRUM V
DRUM U
DRUM W
DRUM COM
CN501
W124
W213
MECHA CHASSIS BLOCK
M901 DRUM MOTOR
CC-52P BOARD
(See Page 137)
Q501
DRUM DRIVE SATULATION CONTROL
DRUM I COM
RF SW P
CN204
CHEACK PIN
CN203
RF SWP
AUDIO (AU-132)
IC504
CAPSTAN MOTOR DRIVE
CAP VS
CAP FWD/RVS
CAP ON
CAP CW/CCW
STBY
POWER OFF
120° LOGIC
HE POWER
Vcc1
Vcc2
Vcc3
REG 5V (W605 ③)
VTR UNREG (W605 ⑧)
UHE (+) (−)
VHE (+) (−)
WHE (+) (−)
CAP U
CAP V
CAP W
C HALL Vcc
H1 (+),(−)
H2 (+),(−)
H3 (+),(−)
C HALL GND
W502
CN502
MECHA CHASSIS BLOCK
M902 CAPSTAN MOTOR
HALL DEVICE

3-9. SYSTEM CONTROL BLOCK DIAGRAM


VS-91 BOARD (See Page 123)
IC601 SYSTEM CONTROL
(See Page 145)
FK-41P BOARD
S907 REC
(E, Australian model ONLY)
S906
S905
S904 FF
S903
S902 REW
W901
MO 3
MI 5
MI 4
MI 3
MI 2
MI 1
MI 0
CN603
D603
D604
(See Page 146)
EJ-20P BOARD
S915 EJECT
CN613
CN902
EJECT SW
E, Australian model
VTR
AEP UK model
PLAYER
OFF
CAMERA
S901 POWER
VTR POWER SW
CAM POWER SW
REC S/S SW
CN903
SW-158P BOARD
(See Page 147)
S921 LOCK
STANDBY
S922 START/STOP
W941
ZOOM SWITCH UNIT
(See Page 146)
CN911
W912
CAM
CAM POWER SW
CAM S/S SW
MECHA CHASSIS BLOCK
DEW SENSOR
(See Page 137)
CC-52P BOARD
W215
W214
CN601
Q614-616 DEW DET
(See Page 137)
FP-89 BOARD
S991 C LOCK SW
CN211
C LOCK SW
CN602
FP-90 BOARD
S992(1/2) ME/MP
CN212
ME/MP
ME/MP (VIDEO(2))
(See Page 151)
(See Page 92)
CF-25P BOARD
(See Page 152)
S770 EDIT ON OFF
W768
W756
W755
CF-23P BOARD
W979
CN975
CB-34P BOARD
CN802
CN804
VC-117 BOARD
(See Page 151)
W604
EDIT SW
CAMERA (VC-117) CAM ADJ
Q603(1/2) PORT CHK
N.C
Q610 (1/2) LINE ON
Q610(1/2) CAM ADJ
Q601(1/2) R S/S
Q601(1/2) EJECT
Q602(1/2) DEW
Q602(1/2) C LOCK
Q603(1/2) C POWER
Q606(1/2) VTR POWER
Q604(1/2) TAPE TOP
Q604(1/2) TAPE END
Q617 TAPE TOP DET
Q618 TAPE END DET
TAPE TOP
TAPE END
Q606(1/2) EDIT
Q607(1/2) M SW C
Q607(1/2) M SW B
Q608(1/2) M SW A
Q608(1/2) TEST
Q609(1/2) PATH
Q609(1/2) REC PROOF
SP/LP
Q620(1/2), Q621(1/2)
Q620(1/2), Q621(1/2)
Q992 TAPE TOP SENSOR
Q991 TAPE END SENSOR
FP-90 BOARD
FP-89 BOARD
(See Page 137)
CC-52P BOARD
FP-89 BOARD
S993 MODE SWITCH
MODE SW C
MODE SW B
MODE SW A
WAKE UP DETECTOR
Q612
Q613
(See Page 137)
FP-90 BOARD
S992(1/2) REC PROOF
D993 T REEL SENSOR
CC-52P BOARD
FP-89 BOARD
D991 S REEL SENSOR
CN204
TEST
CAM ADJ
TEST
PATH
EDIT
IC604 (1/2) T REEL FG AMP
IC604 (1/2) S REEL FG AMP
5V
16MHz
X601 16MHz
IC601 (34), (35) REC/PB (34) 26 Vp-p (35) 2Vp-p
PB RF (VIDEO(2) Q162)
Q541 PB RF AMP
PB RF (SERVO)
Q661 LPF
Q662,663 ENVELOPE DET
IC607 (1/2) CLOG DET
Q665
Q664
IC607 (1/2) CUE/REV,SP/LP DET
MO 4
MO 3
MO 2
MO 1
MO 0
MI 5
MI 4
MI 3
MI 2
MI 1
MI 0
T REEL FG
S REEL FG
HALL ON
X TAL
EX TAL
WAKE UP
CLOG
CUE/REV,SP/LP
LIM CONT
LD
UN LD
Vdd
Vpp
A Vdd
A Vref
EVER 5V (IC602)
T/E LED ON
Q619 LED DRIV
VIDEO CS
VIDEO CS
COSMO SCK
COSMO SO
EDIT
ME/MP
EDIT SW(W604 (15))
ME/MP(CN60 (12))
PAUSE LED
CAUTION LED
REC 1A
REC 2A
REC 1B
REC 2B
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE
FE ON
RP PB MODE
ME/MP
FE ON
Q623
RP PB MODE
RP PB MODE (SERVO)
(VIDEO(2))
IC205 EXPANTION PORT
AUDIO STB
A.STB
SYSTEM RESET
Q645
SYSTEM RESET
OE
D605
IC603 RESET
EVER 5V
RESET
SCK
SO
COSMO SCK
COSMO SO BUS
COSMO SI BUS
Q643(1/2)
Q643(1/2)
Q644
COSMO CS
BATT SENSE
VTR ON
CAM ON
Q611(1/2)
Q611(1/2)
TALLY LED
LINCS POWER
D606
W604
SERIAL CONT
CN802
VC-117 BOARD
CN804
SERIAL CONT
(See Page 119)
09


IC601
SYSTEM CONTROL
MO 4
MO 3
MO 2
MO 1
MO 0
MI 5
MI 4
MI 3
MI 2
MI 1
MI 0
LIM CONT
LD
UN LD
VDD
VPP
A VDD
A VREF
EVER 5V (IC602)
T/E LED ON
VIDEO CS
PAUSE LED
CAUTION LED
REC 1A
REC 2A
REC 1B
REC 2B
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE
FE ON
RP PB MODE
AUDIO STB
SYSTEM RESET
RESET
COSMO SCK
COSMO SO BUS
COSMO SI BUS
COSMO CS
BATT SENSE
VTR ON
CAM ON
TALLY LED
LINCS POWER
T REEL FG
S REEL FG
HALL ON
X TAL
EX TAL
WAKE UP
CLOG
CUE/REV, SP/LP
Q604(1/2) TAPE TOP
Q604(1/2) TAPE END
Q606(1/2) EDIT
Q607(1/2) M SW C
Q607(1/2) M SW B
Q608(1/2) M SW A
Q608(1/2) TEST
Q609(1/2) PATH
Q609(1/2) REC PROOF
S/S
JECT
DEW
LOCK
POWER
TR POWER
Q617 TAPE TOP DET
Q618 TAPE END DET
TAPE TOP
TAPE END
CN602
W215
CN212
CN211
Q992 TAPE TOP SENSOR
Q991 TAPE END SENSOR
FP-90 BOARD
FP-89 BOARD
(See Page 137)
CC-52P BOARD
FP-89 BOARD
S993 MODE SWITCH
CN211
W214
CN601
MODE SW C
MODE SW B
MODE SW A
WAKE UP DETECTOR
Q612
Q613
(See Page 137)
FP-90 BOARD
S992(1/2) REC PROOF
D993 T REEL SENSOR
CC-52P BOARD
CN212
FP-89 BOARD
D991 S REEL SENSOR
5V
CN211
W215
CN204
TEST
CAM ADJ
TEST
PATH
SP/LP
EDIT
CN602
IC604 (1/2)
T REEL FG AMP
IC604 (1/2)
S REEL FG AMP
X601 16MHz
16MHz
(34) 2.6Vp-p
(35) 2Vp-p
IC601 (34), (35) REC/PB
PB RF (VIDEO(2) Q162)
Q541 PB RF AMP
PB RF (SERVO)
Q661 LPF
Q662,663 ENVELOPE DET
IC607 (1/2)
CLOG DET
Q665
IC607 (1/2)
CUE/REV, SP/LP DET
Q664
CC-52P BOARD
(See Page 137)
CN607
LM LOAD
LM UNLOAD
W216
W215
LOAD
UNLOAD
SENSOR COM(+)
MECHA CHASSIS BLOCK
M903 LOADING MOTOR
CN602
+5V (Q682)
Q619 LED DRIVE
CN212
TAPE LED(K)
FP-90 BOARD
D992 FOR TAPE TOP/END DETECT LED
(See Page 137)
VIDEO CS
COSMO SCK
COSMO SO
EDIT
ME/MP
(VIDEO(1))
EDIT SW(W604 (5))
ME/MP(CN60 (12))
ME/MP
FE ON
Q623
RP PB MODE
RP PB MODE (SERVO)
(VIDEO(2))
Q645
SYSTEM RESET
D605
IC603
RESET
EVER 5V
IC205
EXPANTION PORT
A STB
OE
SCK
SO
SP/LP
VA PB MODE
A MUTE
V MUTE
CAM/LINE
JOG DEW LED
REC LED
POWER SAVE
SP/LP
VA PB MODE
V MUTE
CAM/LINE
JOG
POWER SAVE
VIDEO(1) BLOCK
CN203
SP/LP
AUDIO MUTE
CAM/LINE
VA PB MODE
AUDIO (AU-132)
W604
Q643(1/2)
Q643(1/2)
Q644
DDS SO
DDS SCK
DDS SI
CAMERA FUNCTION (VC-117)
COSMO CS
SYSTEM RESET
AUDIO FOCUS (VC-117)
W605
Q611(1/2)
Q611(1/2)
BATT SENSE
VTR ON
CAM ON
POWER DD-31P DC-DC CONVERTER
CN205
TALLY
EVF (VF-41P)
D606
W604
SERIAL CONT
CN802
VC-117 BOARD
CN804
SERIAL CONT
(See Page 119)
(See Page 151)
CN975
CN976
CB-34P BOARD
CN904
CN903
FK-41P BOARD
(See Page 145)
(See Page 146)
W912
CN911
ZOOM SWITCH UNIT
SW-158P BOARD
W941
J902 REMOTE
(See Page 147)
(See Page 141)
RM-57P BOARD
IC102
SIRCS CONTROL
CN101
Q101
Q102
LANC INT
LANC OUT
SIRCS IN
X101 4MHz
X2
X1
IC101
REMOTE CONTROL RECIEVER
S101
REMOTE COMANDER
OFF
ON
VDD
RESET
IC103
RESET
IC104
5V REG
DC OUT (CN101 (1))
6Vp-p
4.0MHz
IC102 (8)

3-10. SYSTEM CONTROL SECTION FUNCTION DESCRIPTION

The system control section consists of following four microcomputers:

- Mode/mechanism control microcomputer CXP80116
- DDS microcomputer μPD7503GF
- EVR microcomputer MC68HC05N4
- AF microcomputer MC68HC05C4

3-10-1. Mode/Mechanism Control Microcomputer CXP80116 (IC601 on VS-91 Board)

1. Function description

1) Power ON/OFF control
2) Key matrix read
   (Playback, Record, Fast-forward, Rewind, Pause, Stop, VIDEO (PLAYER)/CAMERA Power Supply, Cassette Eject, START/STOP)
3) Servo
4) Loading motor control
5) Error detection
   - Battery end/pre-end
   - Tape end
   - No cassette
   - Erasure prevention
   - DEW (condensation)
   - PAUSE release
   - CLOG (head clog)
   - L.MOTOR EMERGENCY
   - Drum rotation
   - Drum phase
   - Reel rotation
   - Capstan rotation
   - Drum/capstan start
6) H.M.S. counter
7) JOG VD insertion
8) Execution of various modes

2. Abbreviated specifications

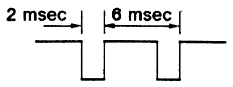
- 8-bit high-speed, highly integrated single chip microcomputer
- A/D converter, 8-bit, 8-channel
- Serial interface
- Time/counter
- Time base timer
- Vector interrupts
- High precision timing pattern generation function (high-speed output)
- PWM/DA gate pulse output, 12-bit, 2-channel
- High precision measurement function (FRC) for servo signals
- Power on reset function
- Sleep and stop functions
- External memory expansion mode, microprocessor mode
- ROM: 16 Kbytes
- RAM: 352 Kbytes
- Speed: 500 ns
- Process: C MOS
- Operating voltage: 4.5 to 5.5V
- Package: 80-pin flat package

3. Terminal function (CXP80116)

<table>
<tr><th>Pin No.</th><th>Signal Name</th><th>I/O</th><th colspan="2">Function</th><th>Connection</th></tr>
<tr><td>1</td><td>SEL 2</td><td>O</td><td colspan="2" rowspan="2">ATF REF PILOT signal frequency (f1 to f4) selecting signal. (*1)<table><tr><td>ATF REF PILOT</td><td>f1</td><td>f2</td><td>f3</td><td>f4</td></tr><tr><td>SEL 1</td><td>H</td><td>L</td><td>H</td><td>L</td></tr><tr><td>SEL 2</td><td>H</td><td>H</td><td>L</td><td>L</td></tr></table></td><td rowspan="2">To ATF servo IC
(IC505: CXA1204Q)</td></tr>
<tr><td>2</td><td>SEL 1</td><td>O</td></tr>
<tr><td>3</td><td>PB 2B MUTE</td><td>O</td><td colspan="2" rowspan="4">Not used. Fixed at "L".</td><td rowspan="4"></td></tr>
<tr><td>4</td><td>PB 1B MUTE</td><td>O</td></tr>
<tr><td>5</td><td>PB 2A MUTE</td><td>O</td></tr>
<tr><td>6</td><td>PB 1A MUTE</td><td>O</td></tr>
<tr><td>7</td><td>$\overline{\text{REC 2B}}$</td><td>O</td><td colspan="2" rowspan="4">Not used. Fixed at "H".</td><td rowspan="4"></td></tr>
<tr><td>8</td><td>$\overline{\text{REC 1B}}$</td><td>O</td></tr>
<tr><td>9</td><td>$\overline{\text{REC 2A}}$</td><td>O</td></tr>
<tr><td>10</td><td>$\overline{\text{REC 1A}}$</td><td>O</td></tr>
<tr><td>11</td><td>SYSTEM SYNC</td><td>O</td><td colspan="2">INT-V signal for drum servo. (*1)</td><td></td></tr>
<tr><td>12</td><td>CAM ON</td><td>O</td><td colspan="2">Camera DC/DC converter on/off signal. "H" when power of camera is turned on.</td><td>To DC/DC converter</td></tr>
<tr><td>13</td><td>VTR ON</td><td>O</td><td colspan="2">VTR DC/DC converter on/off signal. "H" when power of camera or video is turned on.</td><td>To DC/DC converter</td></tr>
<tr><td>14</td><td>SYSTEM RESET</td><td>O</td><td colspan="2">Reset AF microcomputer during Power ON, and input to video/audio extension port (IC205) to mute audio signal during Power ON.</td><td>Pin ⑨ of IC612 and Pin ⑥⓪ of IC613 on VC-117 board, Pin ⑮ of IC205 on VS-91 board.</td></tr>
<tr><td>15</td><td>$\overline{\text{VIDEO CS}}$</td><td>O</td><td colspan="2">Selecting signal to video IC, CXA1200BQ and CXA1201Q of internal bus signal. Select by "L".</td><td>Pin ㉑ of IC201
Pin ⑰ of IC203</td></tr>
<tr><td>16</td><td>$\overline{\text{AUDIO STB}}$</td><td>O</td><td colspan="2">Data strobe signal to video/audio extension port (IC205) of internal bus communication. Latch by ↑.</td><td>Pin ① of IC205</td></tr>
<tr><td>17</td><td>CAP FWD/$\overline{\text{RVS}}$</td><td>O</td><td colspan="2">Capstan rotation direction control signal.
FWD by "H", RVS by "L". (*1)</td><td>Pin ⑳ of IC504</td></tr>
<tr><td>18</td><td>CAP ON</td><td>O</td><td colspan="2">Capstan driver ON control signal. Capstan ON by "H". (*1)</td><td>Pin ⑬ of IC504</td></tr>
<tr><td>19</td><td>T/E LED ON</td><td>O</td><td colspan="2">TAPE top/end LED driving signal.</td><td>Q619Ⓑ</td></tr>
<tr><td>20</td><td>UNLOAD</td><td>O</td><td colspan="2" rowspan="2">Loading motor control signal<table><tr><td>Conditions / Signals</td><td>OFF</td><td>LOADING</td><td>UN-LOADING</td><td>BRAKE</td></tr><tr><td>LOAD</td><td>L</td><td>H</td><td>L</td><td>H</td></tr><tr><td>UNLOAD</td><td>L</td><td>L</td><td>H</td><td>H</td></tr></table></td><td>To loading motor</td></tr>
<tr><td>21</td><td>LOAD</td><td>O</td><td>To loading motor</td></tr>
<tr><td>22</td><td>MO4</td><td>O</td><td colspan="2" rowspan="5">Only Matrix output $\overline{\text{MO3}}$ is "L" active.
Only $\overline{\text{MO3}}$ is "L" pulse output, the other ports are "H" pulse output.</td><td rowspan="5"></td></tr>
<tr><td>23</td><td>$\overline{\text{MO3}}$</td><td>O</td></tr>
<tr><td>24</td><td>MO2</td><td>O</td></tr>
<tr><td>25</td><td>MO1</td><td>O</td></tr>
<tr><td>26</td><td>MO0</td><td>O</td></tr>
<tr><td>27</td><td>$\overline{\text{PAUSE LED}}$</td><td>O</td><td>Not used.</td><td rowspan="3">Middle withstand voltage (12V), Large current (12 mA) port.</td><td>Pin ② of Pause LED driver Q624</td></tr>
<tr><td>28</td><td>$\overline{\text{CAUTION LED}}$</td><td>O</td><td>Not used.</td><td>Pin ⑤ of Caution LED driver Q624</td></tr>
<tr><td>29</td><td>$\overline{\text{TALLY LED}}$</td><td>O</td><td>External TALLY LED and EVF internal TALLY drive. "L" when TALLY LED is lit.</td><td>TALLY LED</td></tr>
</table>

Pin No.	
30	$\overline{\text{HAL}}$
31	MP
32	$\overline{\text{RESI}}$
33	V_{SS}
34	XTA
35	EXT
36	$\overline{\text{COSI}}$
37	COSI
38	COSI
39	$\overline{\text{COSI}}$
40	MI 5
41	MI 4
42	MI 3
43	MI 2
44	MI 1
45	$\overline{\text{WAK}}$
46	BAT
47	N.C.
48	SW
49	T RE
50	S RE
51	ATF
52	AVss
53	AVR
54	AVD
55	DRU
56	MI 0
57	CLO
58	COM
59	CUE SP/L
60	DRU
61	DRU
62	CAP
63	DRU

nnection
servo IC CXA1204Q)
C converter
C converter
f IC612 and Pin 613 on VC-117 in ⑮ of IC205 1 board.
f IC201 f IC203
f IC205
f IC504
f IC504
ng motor
ng motor
Pause LED 524
Caution LED 524
LED

Pin No.	Signal Name	I/O	Function	Connection
30	$\overline{\text{HALL ON}}$	O	Reel FG sensor LED drive, middle withstand voltage and large current port. 	Reel sensor
31	MP	I	Microcomputer processor mode selecting pin → unselecting.	GND
32	$\overline{\text{RESET}}$	I	Reset input. "L" active.	Pin ③ of reset IC IC603
33	V_{SS}		GND	GND
34	XTAL	O	Crystal connecting pin for system clock oscillation. Oscillation at: 16 MHz.	Oscillation crystal X601
35	EXTAL	I		
36	$\overline{\text{COSMO CS}}$	I	Selecting signal from DDS microcomputer of internal bus communication to mode/mechanism control. Selected by "L".	DDS microcomputer Pin ⑭ of IC561 on VC-117 board
37	COSMO SI BUS	I	Serial data input pin.	
38	COSMO SO BUS	O	Serial data output pin.	
39	$\overline{\text{COSMO SCK}}$	I/O	Input/output pin for serial clock.	
40	MI 5	I	Matrix input.	
41	MI 4			
42	MI 3			
43	MI 2			
44	MI 1			
45	$\overline{\text{WAKE UP}}$	I	STBY release input. Released by "L".	
46	BATT SENSE	I	Battery end/pre-end voltage input. A/D input pin.	Inside BATT END ADJ (DD-31P board RV101)
47	N.C.			
48	SW POS ADJ	I	Switching position adjustment input (Test mode). A/D input pin	SW POS ADJ RV602
49	T REEL FG	I	T-reel/S-reel FG input. A/D input pin.	Pin ⑦ of IC604
50	S REEL FG	I		Pin ① of IC604
51	ATF ERROR	I	ATF error (ATF LOCK error)input. A/D input pin.	Pin ⑫ of ATF IC IC505
52	AV_{SS}		A/D converter GND pin.	GND
53	AV_{REF}	I	A/D converter reference voltage input pin	Pin ① of regulator IC IC602 for EVER 5V
54	AV_{DD}		A/D converter positive power supply pin	
55	DRUM PG	I	DRUM PG input. FRC (High precision timer)capture input pin.	Pin ⑨ of Sense amp IC502
56	MI 0	I	Matrix input	
57	CLOG	I	Clog detection signal input. Clog by "H".	Q665 ©
58	COMPOSITE SYNC	I	Composite sync signal input (Incorporated V SYNC separator)	Pin ⑭ of VIDEO IC IC201
59	CUE/REV SP/$\overline{\text{LP}}$	I	SP/LP discrimination signal input when CUE/REV, etc. "H" when SP mode, "L" when LP mode.	Q664 ©
60	DRUM PG	I	Not used.	Pin ⑨ of Sense amp IC502
61	DRUM FG	I	DRUM FG input pin. FRC capture input pin.	Pin ⑩ of Sense amp IC502
62	CAP FG	I	CAPSTAN FG input pin. FRC capture input pin.	Pin ⑫ of Sense amp IC502
63	DRUM STEP	O	Nut used.	

Pin No.	Signal Name	I/O	Function	Connection
64	DRUM $\overline{\text{FWD}}$/RVS	O	DRUM rotation direction control signal. RVS by "H", FWD by "L".	Pin ③ of IC501
65	CAP ERH	O	H level output pin to set capstan error to maximum level when capstan start and stop.	Pin ⑫ of IC604
66	DRUM D/A	O	DA gate pulse output pin to output DRUM error. Exclusive servo output pin (DA mode).	
67	CAP PWM	O	PWM output pin servo exclusive output pin to output cap error (PWM mode)	
68	LIM CONT	O	Not used.	
69	CAP FG	I	External event input pin to Cap FG input pin exclusive counter for Tape counter drive	Pin ⑫ of Sense amp IC502
70	$\overline{\text{LINCS POWER}}$	I	Input to release microcomputer standby to turn on the unit from external with remote commander.	Remote jack Pin ② of J941 on SW-158P board
71	$\overline{\text{NMI}}$	I	Non-maskable interrupt request pin. NMI is not used.	EVER 5V
72	V_{DD}		Positive power supply pin	EVER 5V
73	V_{SS}		GND pin.	GND
74	V_{PP}		N.C.	EVER 5V
75	DRUM ON	O	DRUM driver ON control signal.	Pin ⑦ of IC501
76	JOG VD	O	Insert to VIDEO signal when variable speed playback. Simulated VD output pin. (*1)	Pin ⑤ of IC201
77	RP PB MODE	O	Switching signals for REC/PB amplifier and REC/PB mode of ATF IC. (*1)	ATF IC Pin ㉕ of IC505 REC/PB amp (IC101, IC102)
78	$\overline{\text{FE ON}}$	O	RF SWP output pin (*1)	Flying erase oscillation circuit
79	RF SWP	O	RF SWP output pin. (*1)	REC/PB amp
80	RF SWP	O	RF SWP output pin. (*1)	REC/PB amp Video system

*1: High precision real time pattern output and high precision real time pulse output terminal

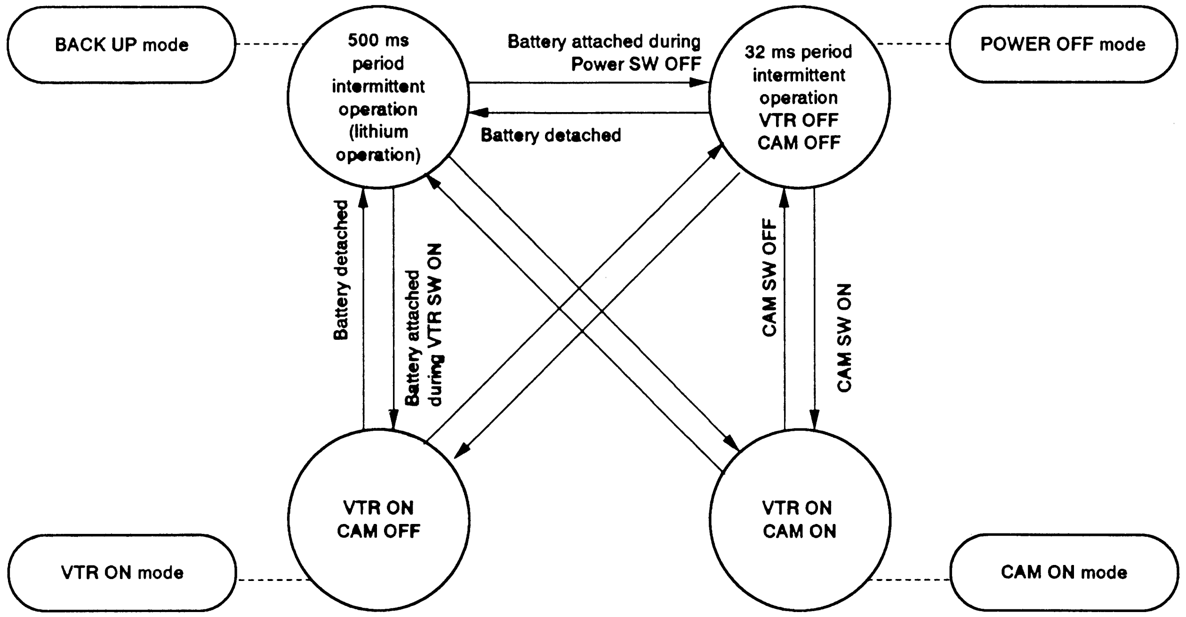
3-10-2. DDS microcomputer μPD7503GF (IC561 on VC-117 Board)

1. Function description

1) Internal data communication control
2) Date/time measurement
3) LCD indication
4) Reading of key matrix
   (White balance, electronic shutter, edit search +/–, auto-lock, focus mode, counter reset, zero memory, title, store, color/mode, backlight, compensation, date/forward, time/set, fader)

2. Operation modes

- As shown in the chart below, the operation mode is shifted according to the position of the power switch (Camera/off/Video (Player)) and whether or not there is a main battery.


BACK UP mode
500 ms period intermittent operation (lithium operation)
Battery attached during Power SW OFF
Battery detached
32 ms period intermittent operation VTR OFF CAM OFF
POWER OFF mode
Battery detached
Battery attached during VTR SW ON
CAM SW OFF
CAM SW ON
VTR ON CAM OFF
VTR ON CAM ON
VTR ON mode
CAM ON mode

- **The main DDS microcomputer functions in each mode is as follows.**

Mode	Main Battery	Power Switch	Microcomputer power supply	Clock Mode	LCD	EVF	Main Functions
BACK UP	No	Camera/ off/ video	LI 3V (Lithium battery)	500 ms period intermittent oscillation	–	–	• Backup of title and tape counter data • Clock count operation
POWER OFF	Yes	Off	EVER 5V (Main battery)	32 ms period intermittent oscillation	○	–	• Counter/date/time indication to LCD • Date/time set function (Zero memory and counter reset are invalid.)
VTR ON	Yes	Video	EVER 5V + SS 5V (Main battery)	Continuous oscillation	○	–	• Serial communication with EVR and mode/mechanism control microcomputer • Indication to LCD • Acceptance of zero memory and counter reset keys
CAM ON	Yes	Camera	EVER 5V + SS 5V (Main battery)	Continuous oscillation	○	○	• VTR ON functions and all camera features • Indication control for white balance, focus, titles, electronics shutter, etc. • Indication to EVF and LCD

3. Terminal function and Input/output level (μPD7503GF)

Pin No.	Signal Name	I/O	Functions and I/O Level
1	——	–	
2	$\overline{\text{CMO 2}}$	O	Key matrix output signal. "L" pulse of 22 ms (VTR mode) or 1V period (camera mode).
3	$\overline{\text{CMO 1}}$	O	
4	$\overline{\text{CMO 0}}$	O	
5	DDS SI	I	Serial communication and data input. V period "L" pulse train.
6	DDS SO	O	Serial communication and data output. V period "H" pulse train.
7	$\overline{\text{DDS SCK}}$	I/O	Serial communication and serial clock input/output. V period "L" pulse train.
8	$\overline{\text{TEST}}$	I	Test mode input. Normally "H".
9	$\overline{\text{LI PE}}$	I	Lithium battery pre-end detection. Normally "H". "L" when lithium battery voltage drops.
10	VTR PWR	I	SS 5V power detection. "H" when power on.
11	CG BUSY	I	Busy signal input from character generator. V period "H" pulse train.
12	CMO 4	O	Key matrix output signal. "H" pulse of 22 ms (VTR (Player) mode) or 1V period (camera mode).
13	$\overline{\text{EVR CS}}$	O	Chip select signal to EVR microcomputer (IC361 on VC-117 board). "L" pulse of 1V period.
14	$\overline{\text{COSMO CS}}$	O	Chip select signal to servo/system control microcomputer (IC601 on VS-91 board). "L" pulse of 1V period.
15	CG STB	O	Strobe signal for character generator. 1V period "H" pulse train.
16	TG CS	O	Not used.
17	SRAM CS	O	Chip select signal to static RAM. (IC801 on TI-41P board) VTR mode: "L" Camera mode: Normally "L". "H" during title operation.
18	TITLE CS	O	Chip select signal to title controller. (IC802 on TI-41P board) VTR mode: "L" Camera mode: "H" pulse of 1V period.
19	LCD OFF	O	LCD indication ON/OFF control output. Normally "L" (0V). "H" (3V) when backed up by lithium battery.
20	X2	O	Crystal oscillation circuit for clock. Oscillation frequency is 32.768 kHz
21	X1	I	
23	VLC 3	I	LCD power supply 3 input pin. Normally 0V. 3V when backed up.
24	VLC 2	I	LCD power supply 2 input pin. Normally 1.7V. 3V when backed up.
25	VLC 1	I	LCD power supply 1 input pin. Normally 3.3V. 3V when backed up.
26	VDD	I	Power supply input pin.
27	COM 3	O	LCD remote control pin driving output 3. 4 values outputs of 0, 1.7, 3.3, 5V.
28	COM 2	O	LCD remote control pin driving output 2.
29	COM 1	O	LCD remote control pin driving output 1.
30	COM 0	O	LCD remote control pin driving output 0.

Pin No.	
31	
32 to 40	
41 to 54	S13
55	INT
56	RES
57	CL
59	CL
58	VD
60	CM
61	CM
62	CM
63	CM
64	CO

era mode).

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od

ard).

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Pin No.	Signal Name	I/O	Functions and I/O Level
31		I	
32 to 40	———	I	Not used
41 to 54	S13 to S0	O	LCD segment pin driving output, 13 to 0. 4 values outputs of 0, 1.7, 3.3, 5V.
55	INT 1	I	Interrupt input by camera VD. VTR (Player) mode: "H". Camera mode: "H" pulse of 1V period.
56	RESET	I	Normally "L".
57	CL 1	I	System clock oscillation pin. • When video power ON or camera power ON: Continuous oscillation (Oscillation frequency: approx. 330 kHz). • When power OFF: 32 ms period intermittent oscillation (Oscillation frequency: approx. 330 kHz) • When backed up by lithium battery: 500 ms period intermittent oscillation (Oscillation frequency: approx. 70 kHz)
59	CL 2	I	
58	VDD	O	Power supply input pin.
60	CMI 3	I	Key matrix input signal. Normally "H". When key input, "L" pulse of 22 ms (VTR mode) or 1V period (camera mode).
61	CMI 2	I	
62	CMI 1	I	
63	CMI 0	I	
64	$\overline{\text{COM 3}}$	I	Key matrix input signal. Normally "H". When key input, "L" pulse of 22 ms (VTR mode) or 1V period (camera mode).

3-10-3. EVR microcomputer MC68HC05N4 (IC361 on VC-117 Board)

1. Function description

1) EVR control
2) Auto white balance control
3) Electronic shutter

2. Pin function and input/output level (MC68HC05N4)

Pin No.	Signal Name	I/O	Functions and I/O Level
1	———		———
2	$\overline{\text{SSW}}$	O	"H" only during communicating with serial switching D/A converter. "H" pulse of V period.
3	$\overline{\text{SCLK}}$	O	Serial clock output. V period "L" pulse train.
4	SI	I	Serial data input. V period "H" pulse train.
5	SO	O	Serial data output. V period "L" pulse train.
6	$\overline{\text{EVR CS}}$	I	Communication request from DDS. "L" pulse of V period.
7	L IN	I	LANC input. L: 0, H: 1. V period "H" pulse train.
8	L OUT	O	LANC output. L: 0, H: 1. V period "H" pulse train.
9	$\overline{\text{CAM ADJ}}$	I	NORMAL/ADJUST selection. Normally "H". "L" during adjustment.
10		O	
11	SSW	O	Serial signal switching. "L" pulse of V period.
12, 13	LD	O	Data load instruction to EVR (IC252, IC302). "H" pulse of V period.
14	$\overline{\text{BACK LIGHT}}$	O	"L" during backlight compensation ON.
15	IRIS I/O	I	Control from AF microcomputer, Indoor (IN): H, outdoor (OUT): L according to brightness.
16	———		
17	VDD		Connected to EVER 5V.
18			GND
19	———	–	
20	PAL/$\overline{\text{NTSC}}$	I	Broadcast system selection. L: NTSC, H: PAL.
21	TG STB	O	Strobe signal to timing generator DT-77LB board on VC-117 board, Camera mode: pulse of 1V period.
22~25	GND		———
26	GND	–	———
27	GND	–	———
28	CAM 5V	I	Camera power on monitoring. L: CAM OFF, H: CAM ON.
29	AW IN	I	AWB A/D timer stop. Pattern drive interrupt. Normally 2V period pulse.
30	AW ADJ	O	AWB preset data fetch. Normally "L". "H" during auto white balance adjustment.
31	———	–	NC
32	———	–	———
33	———	–	———
34	S3SW	O	AWB measurement signal selection. "H" pulse of 3V period.
35	S2SW	O	AWB measurement signal selection. "H" pulse of 3V period.
36	DISCHG	O	Capacitor reset pulse for timer measurement lamp voltage generation. "H" pulse of V period.
37	———	–	———
38	S1SW	O	AWB measurement signal selection. "H" pulse of 3V period.
39	———	–	———
40	OSC2	O	Built-in inverter output for oscillation. Oscillation frequency: 4 MHz.
41	OSC1	I	Built-in inverter input for oscillation.
42	VDD		Connected to EVER 5V.
43	———		———
44	$\overline{\text{RESET}}$		Normally "H". "L" when reset.
45	$\overline{\text{IRQ}}$		Connected to $\overline{\text{EVR CS}}$ signal. "L" pulse of V period.
46	———	–	Normally "H". "L" when reset.
47	———	–	Normally "H". "L" when reset.
48	$\overline{\text{A/D EN}}$	O	1-bit A/D converter operation ON/OFF output for titler. Normally "H". "L" for 7V period when title memory button (S772 on CF-24P board) is pressed.

3-10-4. AF microcomputer MC68HC05C4 (IC613 on VC-117 Board)

1. Function description

1) AF control
2) Power focus
3) Zoom motor drive

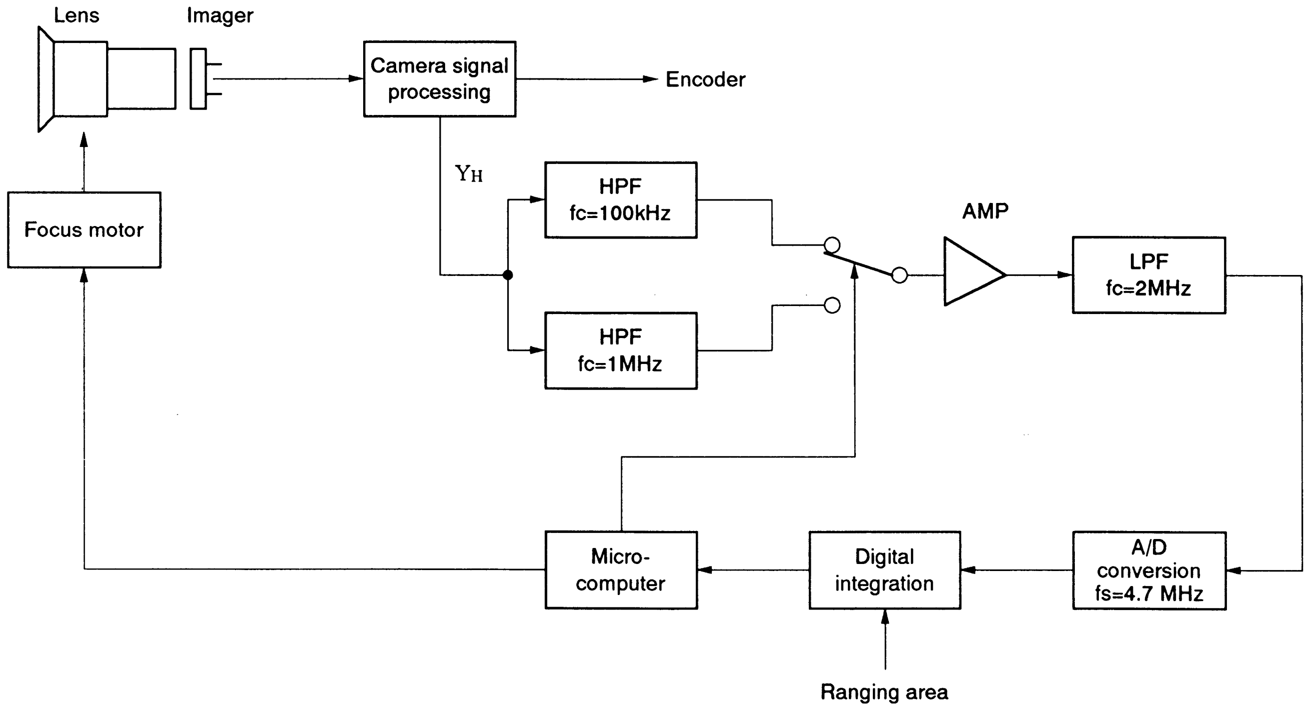
2. Auto focus system of this unit
(Λ -AF: Image processing system)

The high frequency components of video signal (actually luminance signal) are microcomputer processed by TTL without using external sensors to control the focus).

3. Outline of operation

The frequency components from 100k to 2 MHz and from 1M to 2 MHz are extracted from the luminance (Y) signal, and these are digitally integrated for each field. This integration value is called the evaluation value. This evaluation value becomes the information for auto focusing, and focus ring is controlled by finding the peaks in the evaluation values based on the concepts that:

Picture is in focus → edges of image become clearer → high frequency components of image increase → evaluation value increases



4. Pin function and input/output level (MC68HC05C4)

Pin No.	Signal Name	I/O	Functions and I/O Level
1	$\overline{\text{SS}}$ OUT	O	EVR data read timing output (PD5 SS input). V period “L” pulse train.
2	IRIS I/O	O	Indoors/outdoors determination according to aperture value. “H” for indoors and “L” for outdoors.
3	LED CONT	O	Focus position detect LED drive signal. V period “H” pulse.
4			
5			
6	$\overline{\text{MACRO}}$	O	Signal to DDS microcomputer (IC561 on VC-81P board). “L” when zoom ring is at MACRO position.
7	——	–	
8			Not used.
9	——	–	
10	——	–	
11	$\overline{\text{ZOOM T}}$	O	Normally “H”. “L” when zoom motor is rotated in telephoto direction.
12	$\overline{\text{ZOOM W}}$	O	Normally “H”. “L” when zoom motor is rotated in wide angle direction.
13	Focus N	O	Normally “L”. “H” when focus motor is rotated in far range direction.
14	——	–	
15	Focus F	O	Normally “L”. “H” when focus motor is rotated in close range direction.
16	F SPD ϕ	O	Not used.
17	——	–	
18	F SPD1	O	Not used.
19	F SPD2	O	Not used.
20	——	–	
21	F SPD3	O	Not used.
22	——	–	
23	Vss	–	Connected to GND.
24	Vss	–	Connected to GND.
25	——	–	
26	$\overline{\text{F SENS 1}}$	I	Focus position detection signal. V period “H” pulse when focus ring is between about 1.3m and 3m.
27	——	–	
28	WINDOW	O	Auto focus window signal. V period “H” pulse.
29	——	–	
30	$\overline{\text{F SENS 2}}$	I	Focus position detection signal. V period “H” pulse when focus ring is between about 2m and ∞ .
31	AF SSW	O	Timing output for bus selection. “H” pulse of V period.
32	——	–	
33	DA STB	O	D/A converter for AF. For data latch. V period “H” pulse train.
34	PAL/$\overline{\text{NTSC}}$	I	PAL/NTSC selection.
35	——	–	
36	$\overline{\text{J STB}}$	O	External display jig. For data latch. “L” pulse of V period.
37	XCS	O	Active “L” for communication request to IC612 CXD-1204. “L” pulse of V period.
38	PD0	I	Connected to VDD.
39	——	–	
40	PD1	I	Connected to VDD.
41	MISO	I/O	SPI MASTER: in…SLAVE: out…V period “H” pulse train.
42	MOSI	I/O	SPI MASTER: out…SLAVE: in…V period “L” pulse train.
43	$\overline{\text{SCK}}$	I/O	SPI SERIAL CLOCK. V period “L” pulse train.
44	——	–	

Pin No.	Sig
45	$\overline{\text{SS}}$
46	–
47	–
48	$\overline{\text{EVR}}$
49	–
50	–
51	$\overline{\text{Focus}}$
52	CLK
53	–
54	CLK
55	VDD
56	–
57	–
58	–
59	–
60	$\overline{\text{SYS}}$
61	AREA
62	VPP
63	EXT
64	–

for outdoors.

MACRO

1.3m and

2m and ∞ .

Pin No.	Signal Name	I/O	Functions and I/O Level
45	$\overline{SS}$	I	V period "L" pulse train.
46	———	–	
47	———	–	
48	$\overline{EVR\ CS}$	I	EVR data communication request ↓ from DDS microcomputer. "L" pulse of V period.
49	———	–	
50	———	–	
51	$\overline{Focus\ FG}$	I	Interrupt generation by Focus motor FG ↓ . "L" when auto focus OFF. "H" pulse of period according to focus motor rotation speed when auto focus ON.
52	CLK OUT	O	Waveform shaped output of Pin (54) clock (1.77 MHz)
53	———	–	
54	CLK IN	I	External clock input. 14.2 MHz clock input to Pin ㉘ of IC612 is divided by 8 input.
55	VDD		CAM 5V
56	———	–	
57	———	–	
58	———	–	
59	———	–	
60	$\overline{SYS\ RST}$	I	Normally "H". "L" when resetting.
61	AREA	I	Interrupt generation by ↓ from CXD-1204 (IC612). V period pulse
62	VPP		CAM 5V
63	EXT A/M	I	Connected to VDD by 100 kΩ
64	———	–	

3-11. INTERFACE

3-11-1. System Control — Video Audio Block Interface

Signal Name	I/O	Pin No.	VTR Mode														CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB• PAUSE	FRAME	SLOW	REC *14	REC PAUSE *14	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
SP/$\overline{\text{LP}}$	O	Pin ⑭ of IC205 on VS-91 board	1	H	H	*2	*2	*2	*2	*2	*1	*1	*1	*15	H	*16	*15	*2	*2	H	H
VA PB MODE	O	Pin ⑬ of IC205 on VS-91 board	L	L	L	H	H	H	H	H	H	H	H	L	L	L	L	H	H	H	H
AUDIO MUTE	O	Pin ⑫ of IC205 on VS-91 board	L	L	L	H	H	L *3	H	H	H	H	H	L	L	L	L	H	H	L	H
VIDEO MUTE	O	Pin ⑪ of IC205 on VS-91 board	L	L	L	L	L	L *3	L	L	L	L	L	L	L	L	L	L	L	L	L
CAM/$\overline{\text{LINE}}$	O	Pin ⑦ of IC205 on VS-91 board	L	L	L	L	L	L	L	L	L	L	L	L	L	H	H	H	H	H	H
JOG/DEW LED	O	Pin ⑥ of IC205 on VS-91 board	L *4	L	L	H	H	L	H	H	H	H	H	L	L	L	L	L	H	L	H
$\overline{\text{REC LED}}$ *13	O	Pin ⑤ of IC205 on VS-91 board	H	H	H	H	H	H	H	H	H	H	H	L	L	H	H	H	H	H	H
POWER SAVE	O	Pin ④ of IC205 on VS-91 board	H	H	H	L	L	L	L	L	L	L	L	L	H	H	L	L	L	L	L
JOG VD	O	Pin (76) of IC601 on VS-91 board	L	L	L	*5	*5	H	*5	*5	*5	*5	*5	L	L	L	L	L	*5	L	*5
RP PB MODE	O	Pin (77) of IC601 on VS-91 board	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
$\overline{\text{FE ON}}$	O	Pin (78) of IC601 on VS-91 board	H	H	H	H	H	H	H	H	H	H	H	L	H	H	L	H	H	H	H
$\overline{\text{RF SWP}}$	O	Pin (79) of IC601 on VS-91 board	H/L	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6	*6
RF SWP	O	Pin (80) of IC601 on VS-91 board	H/L	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7	*7
PB 2B MUTE	O	Pin ③ of IC601 on VS-91 board	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8	*8
PB 1B MUTE	O	Pin ④ of IC601 on VS-91 board																			
PB 2A MUTE	O	Pin ⑤ of IC601 on VS-91 board																			
PB 1A MUTE	O	Pin ⑥ of IC601 on VS-91 board																			

Signal Name
REC2B
REC1B
REC2A
REC1A
$\overline{\text{VIDEO CS}}$
$\overline{\text{AUDIO STB}}$
COSMO SO
$\overline{\text{COSMO SCK}}$
CUE/REV SP/$\overline{\text{LP}}$
CLOG
COMPOSITE SYNC

*1. Outputs

*2. Outputs
SP mo

*3. “H” at

*4. “H” aft

*5. Simula

*6. 25 Hz

*7. 25 Hz

Signal Name	I/O	Pin No.	VTR Mode													CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SERACH		PB• PAUSE	FRAME	SLOW	REC *14	REC PAUSE *14	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
REC2B	O	Pin ⑦ of IC601 on VS-91 board	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9	*9
REC1B	O	Pin ⑧ of IC601 on VS-91 board																			
REC2A	O	Pin ⑨ of IC601 on VS-91 board																			
REC1A	O	Pin ⑩ of IC601 on VS-91 board																			
$\overline{\text{VIDEO CS}}$	O	Pin ⑮ of IC601 on VS-91 board	"L" pulse of V period.																		
$\overline{\text{AUDIO STB}}$	O	Pin ⑯ of IC601 on VS-91 board																			
COSMO SO	O	Pin ㊳ of IC601 on VS-91 board	V period pulse train.																		
$\overline{\text{COSMO SCK}}$	I/O	Pin ㊴ of IC601 on VS-91 board																			
CUE/REV SP/$\overline{\text{LP}}$	I	Pin (59) of IC601 on VS-91 board	H	*10	*10	*10	*10	L	*10	*10	*10			H	H/L	H/L	H	L	*10	L	*10
CLOG	I	Pin (57) of IC601 on VS-91 board	H	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	*11	H			H	*11	*11	*11
COMPOSITE SYNC	I	Pin (58) of IC601 on VS-91 board	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12	*12

*1. Outputs the determination result of last mode. SP mode "H", LP mode "L".

*2. Outputs the determination result of recording mode of playback tape. SP mode "H", LP mode "L".

*3. "H" at non signal portion of tape

*4. "H" after mode shift completion during dew condensation generation.

*5. Simulated VD signal

*6. 25 Hz duty 50% pulse (synchronized to drum rotation)

*7. 25 Hz duty 50% pulse (synchronized to drum rotation)

*8. Not used. Fixed at "L".

*9. Not used. Fixed at "H".

*10. "H" at SP recording portion of tape, "L" at LP recording portion.

*11. "H" at non recording portion of tape, or drop-out portion. Head clog detection input.

*12. Composite sync signal input (polarity=+) separated from line input video signal, camera video signal, or playback video signal.

*13. Not used.

*14. Effectively for the model installed REC switch.

*15. According to the LP/SP switch position. "H" when the SP position. "L" when the LP position.

*16. According to the LP/SP switch position. "H" when the SP position. "L/H" when the LP position.

3-11-2. System Control — Servo Block Interface

Signal Name	I/O	Pin No.	VTR Mode													CAMERA Mode					
			STOP	FF	REW	FR SEARCH		PB	PICTURE SEARCH		PB• PAUSE	FRAME	SLOW	REC	REC PAUSE	STAND BY	REC	EDIT SEARCH		REC REVIEW	
						CUE	REVIEW		CUE	REVIEW								FWD	RVS	FWD	RVS
T.REEL FG	I	Pin ㊾ of IC601 on VS-91 board	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
S.REEL FG	I	Pin ㊿ of IC601 on VS-91 board	–	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	*1	–	–	*1	*1	*1	*1	*1
ATF ERROR	I	Pin (51) of IC601 on VS-91 board	–	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2	*2
DRUM PG	I	Pins (55) and (60) of IC601on VS-91 board	–	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3	*3
DRUM FG	I	Pin (61) of IC601 on VS-91 board	–	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4	*4
CAP FG	I	Pins (62) and (69) of IC601 on VS-91 board	–	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5	*5
CAP ON	O	Pin ⑱ of IC601 on VS-91 board	L	H	H	H	H	H	H	H	L	*15	*15	H	L	L	H	H	H	H	H
SEL 2	O	Pin ① of IC601 on VS-91 board	–	–	–	*7	*7	*8	*7	*7	*9	*9	*10	*6	H	H	*6	*8	*11	*8	*11
SEL 1	O	Pin ② of IC601 on VS-91 board	–	–	–	*7	*7	*8	*7	*7	*9	*9	*10	*6	L	L	*6	*8	*11	*8	*11
DRUM STEP *12	O	Pin (63) of IC601 on VS-91 board	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM $\overline{\text{FWD}}$/ RVS *13	O	Pin (64) of IC601 on VS-91 board	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
CAP ERH *14	O	Pin (65) of IC601 on VS-91 board	–	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	*15	*15	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ	HIZ
DRUM D/A	O	Pin (66) of IC601 on VS-91 board	–	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16	*16
CAP PWM	O	Pin (67) of IC601 on VS-91 board	–	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17	*17
LIM CONT *12	O	Pin (68) of IC601 on VS-91 board	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
DRUM ON	O	Pin (75) of IC601 on VS-91 board	L	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H	H

*1. Pulse is input by reel rotation.

*2. ATF error voltage input.

*3. 1 PG pulse is input with 1 rotation of drum. Approx. 25 Hz.

*4. 12 FG pulses are input with 1 rotation of drum. Approx. 300 Hz.

*5. Pulses of frequency in proportion to tape speed. Approx. 1327 Hz during REC/PB (SP).

*6. See timing chart 1.

*7. See timing chart 3.

*8. See timing chart 2.

*9. See timing chart 5.

*10. See timing chart 5.

*11. See timing chart 4.

*12. Not used.

*13. Normally "L". "H" temporarily only when loading/unloading (Drum inverts.)

*14. Normally HIZ (High impedance). "H" during start and stop of capstan

*15. "H" pulse when tape is advanced.

*16. "H" pulse/"L" pulse output as center level HIZ (2.5 Vdc).

*17. 64 μsec period PWM signal

*18. Effectively for the model installed REC switch.

3-11-3. Timin

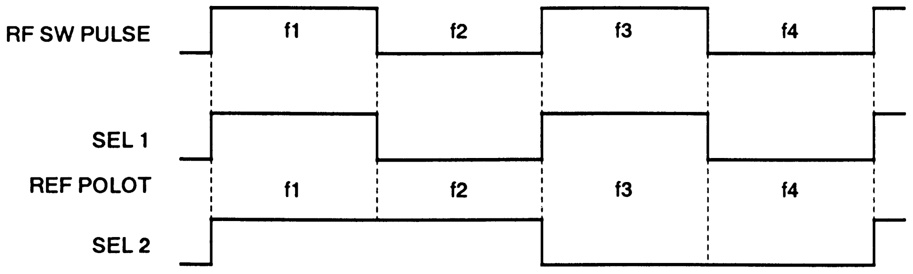
Timing chart 1

Timing chart 2

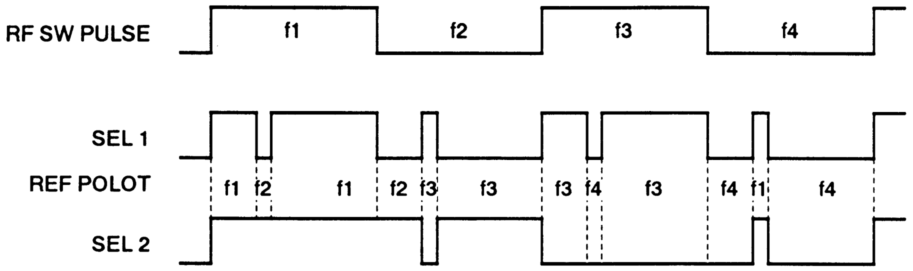
Timing chart 3

3-11-3. Timing Chart

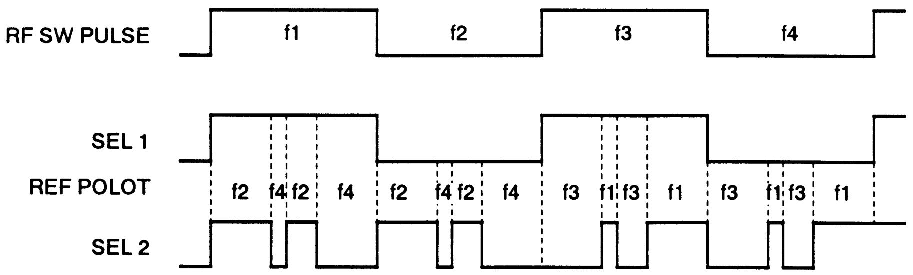
Timing chart 1. REC


RF SW PULSE
f1
f2
f3
f4
SEL 1
REF POLOT
f1
f2
f3
f4
SEL 2

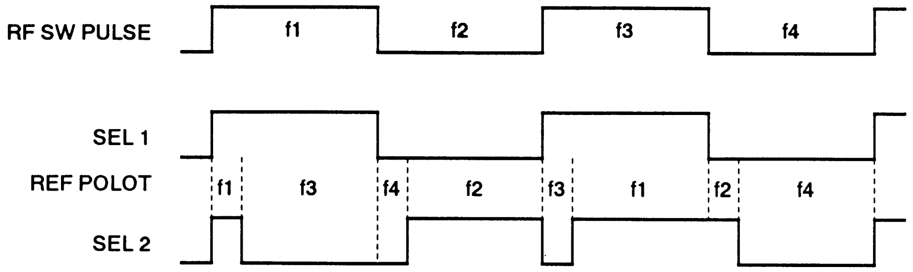
Timing chart 2. PB EDIT-SEARCH (FWD), REC-REVIEW (FWD)


RF SW PULSE
f1
f2
f3
f4
SEL 1
REF POLOT
f1
f2
f1
f2
f3
f3
f3
f4
f3
f4
f1
f4
SEL 2

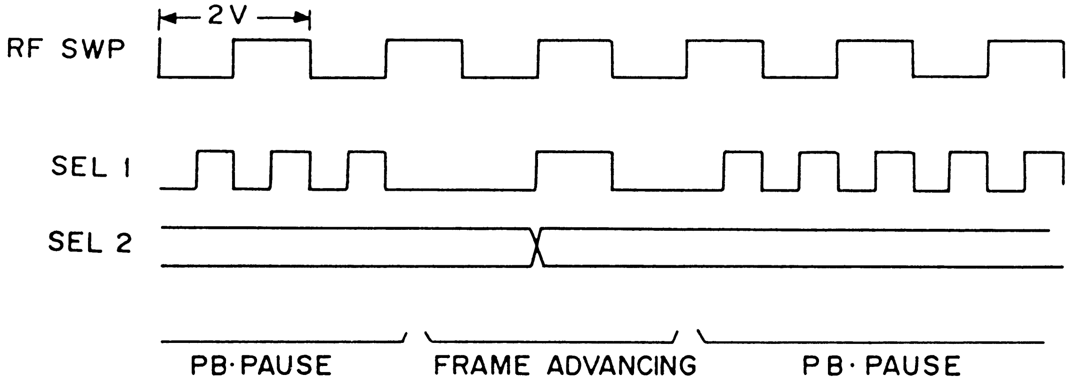
Timing chart 3. FR-SEARCH (CUE/REV), PICTURE-SEARCH (CUE/REV)


RF SW PULSE
f1
f2
f3
f4
SEL 1
REF POLOT
f2
f4
f2
f4
f2
f4
f2
f4
f3
f1
f3
f1
f3
f1
f3
f1
SEL 2

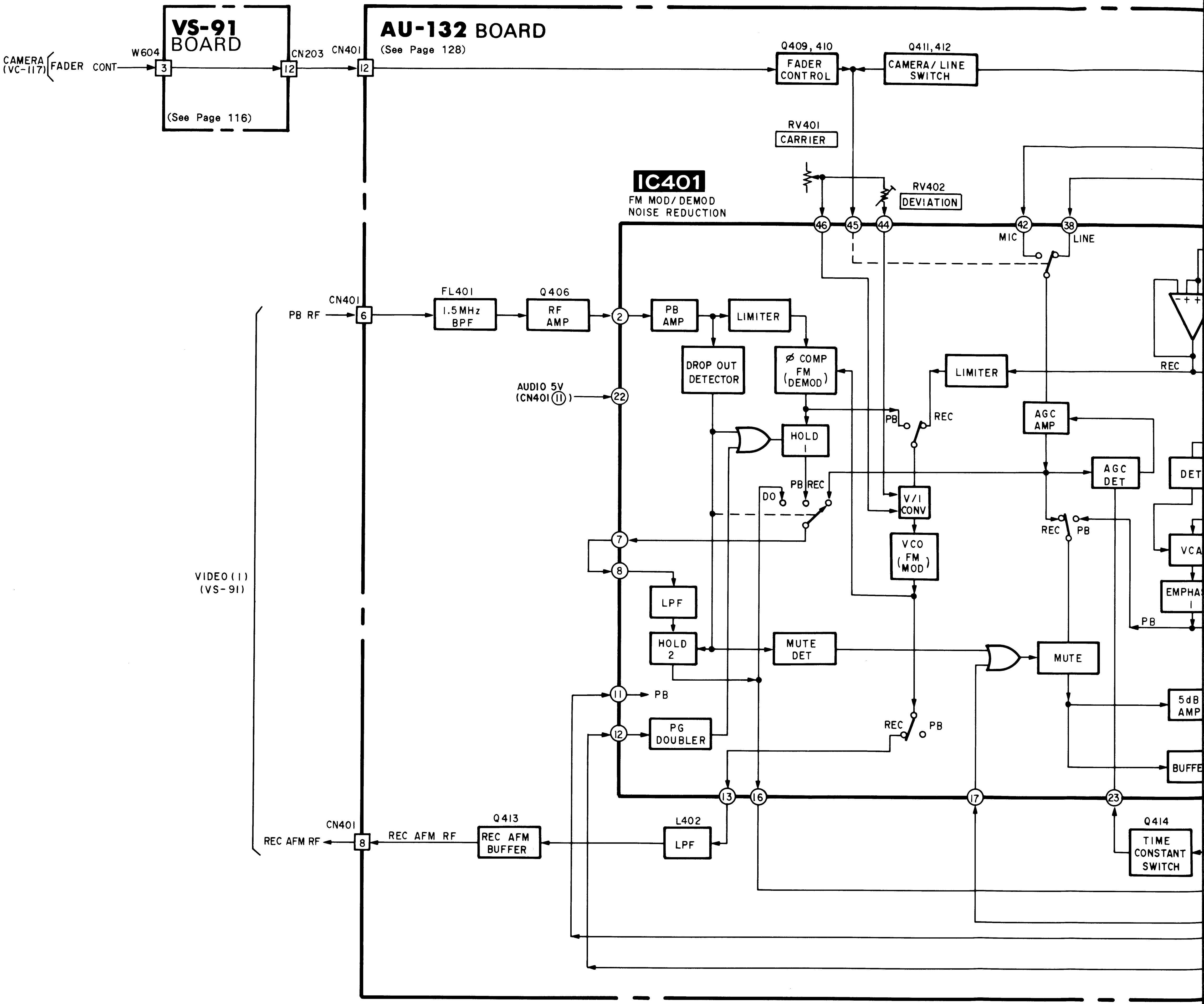
Timing chart 4. EDIT-SEARCH (RVS), REC-REVIEW (RVS)


RF SW PULSE
f1
f2
f3
f4
SEL 1
REF POLOT
f1
f3
f4
f2
f3
f1
f2
f4
SEL 2

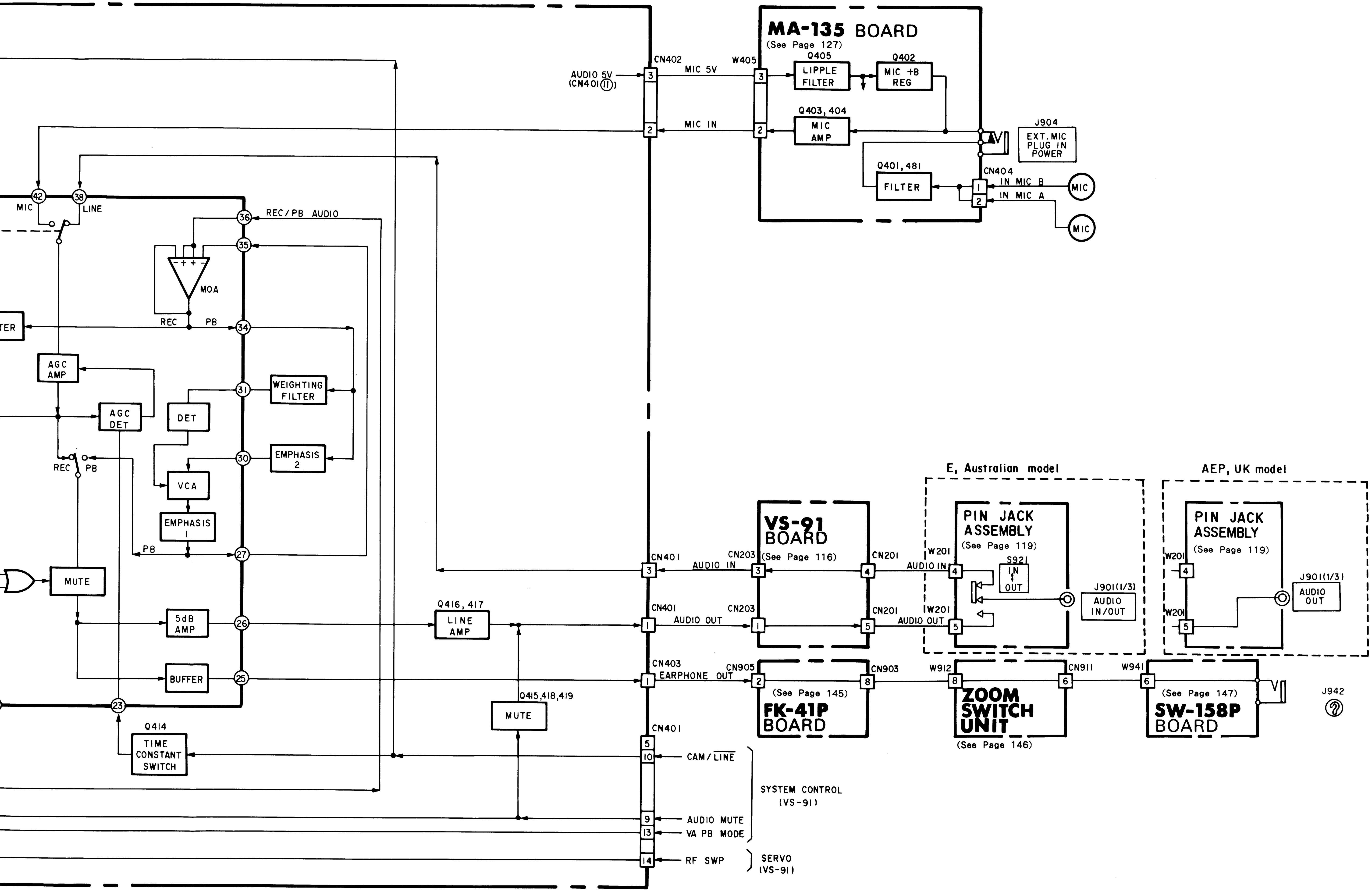
Timing chart 5. PB-PAUSE, FRAME, SLOW


2V
RF SWP
SEL 1
SEL 2
PB·PAUSE
FRAME ADVANCING
PB·PAUSE

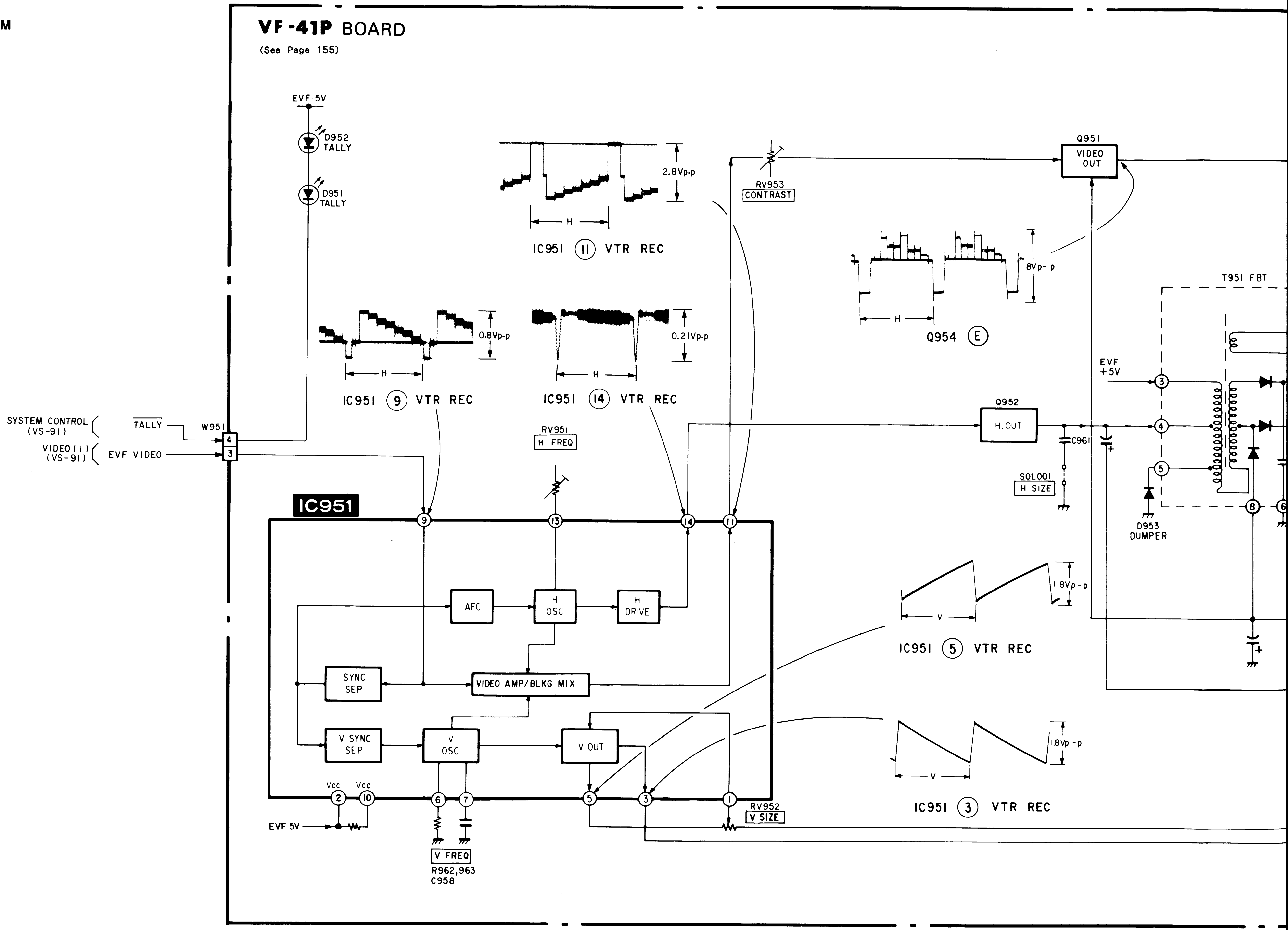
3-12. AUDIO BLOCK DIAGRAM


CAMERA (VC-117)
FADER CONT
W604
VS-91 BOARD
(See Page 116)
CN203
CN401
AU-132 BOARD
(See Page 128)
Q409, 410
FADER CONTROL
Q411, 412
CAMERA/LINE SWITCH
RV401
CARRIER
RV402
DEVIATION
IC401
FM MOD/DEMOD
NOISE REDUCTION
MIC
LINE
PB RF
FL401
1.5MHz BPF
Q406
RF AMP
PB AMP
LIMITER
DROP OUT DETECTOR
ø COMP
FM (DEMOD)
AUDIO 5V
(CN401 ⑪)
HOLD 1
PB
REC
LIMITER
AGC AMP
AGC DET
DET
V/I CONV
VCO
FM (MOD)
DO
VCA
EMPHA
VIDEO (1)
(VS-91)
LPF
HOLD 2
MUTE DET
MUTE
5dB AMP
PG DOUBLER
BUFFE
CN401
REC AFM RF
Q413
REC AFM BUFFER
L402
LPF
Q414
TIME CONSTANT SWITCH

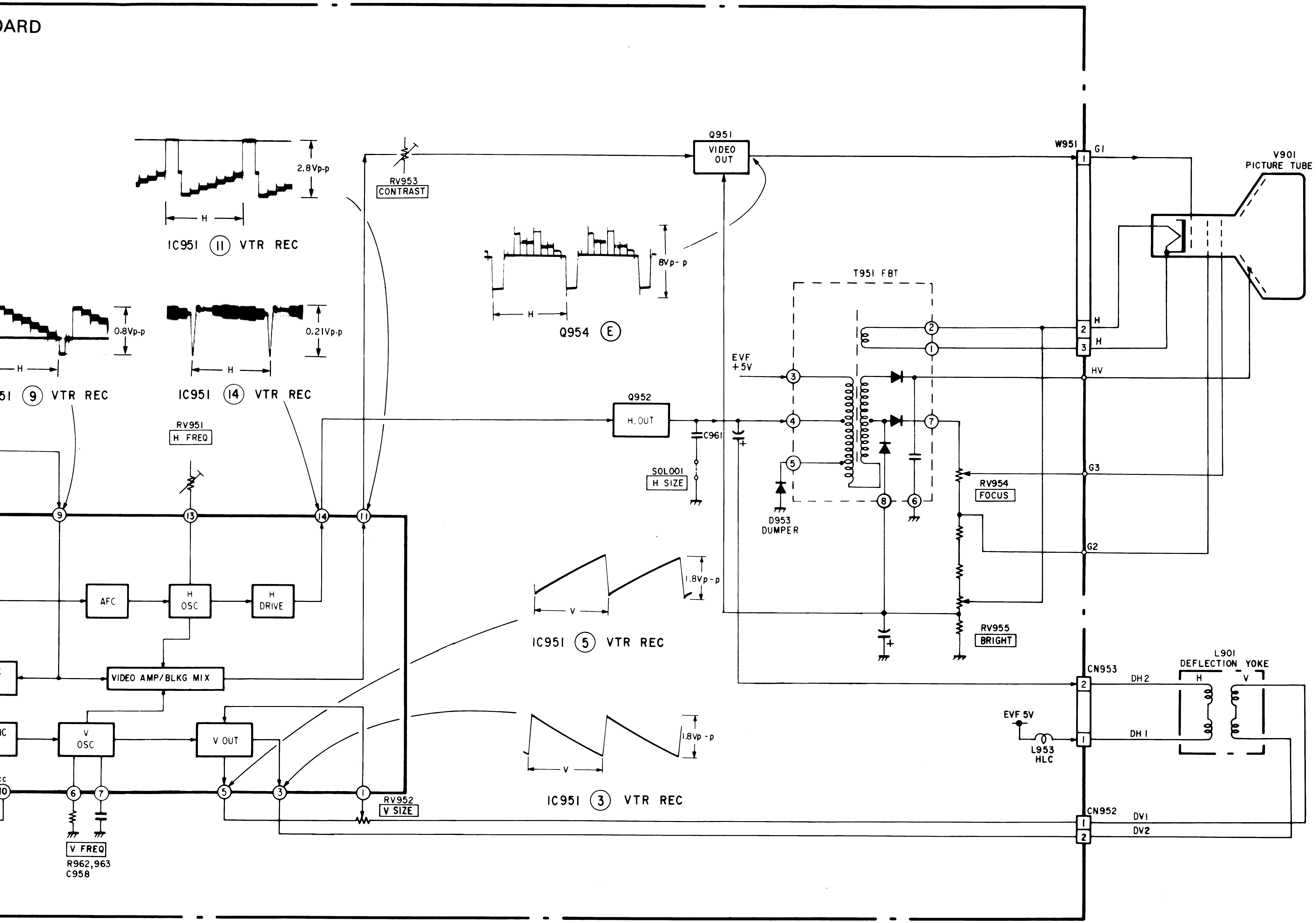
09


MA-135 BOARD
(See Page 127)
CN402
W405
AUDIO 5V
(CN401 ⑪)
MIC 5V
MIC IN
Q405
LIPPLE FILTER
Q402
MIC +B REG
Q403, 404
MIC AMP
Q401, 481
FILTER
J904
EXT. MIC PLUG IN POWER
CN404
IN MIC B
IN MIC A
MIC
MIC
MIC
LINE
REC/PB AUDIO
MOA
REC
PB
TER
AGC AMP
AGC DET
DET
WEIGHTING FILTER
EMPHASIS 2
REC
PB
VCA
EMPHASIS 1
PB
MUTE
5dB AMP
BUFFER
Q416, 417
LINE AMP
Q415,418,419
MUTE
Q414
TIME CONSTANT SWITCH
CN401
AUDIO IN
CN401
AUDIO OUT
CN403
EARPHONE OUT
CN401
CAM/LINE
AUDIO MUTE
VA PB MODE
SYSTEM CONTROL (VS-91)
RF SWP
SERVO (VS-91)
VS-91 BOARD
(See Page 116)
CN203
CN203
CN201
CN201
E, Australian model
PIN JACK ASSEMBLY
(See Page 119)
W201
AUDIO IN
W201
AUDIO OUT
S921
IN
OUT
J901(1/3)
AUDIO IN/OUT
AEP, UK model
PIN JACK ASSEMBLY
(See Page 119)
W201
W201
J901(1/3)
AUDIO OUT
CN905
CN903
FK-41P BOARD
(See Page 145)
W912
ZOOM SWITCH UNIT
(See Page 146)
CN911
W941
SW-158P BOARD
(See Page 147)
J942
⑦

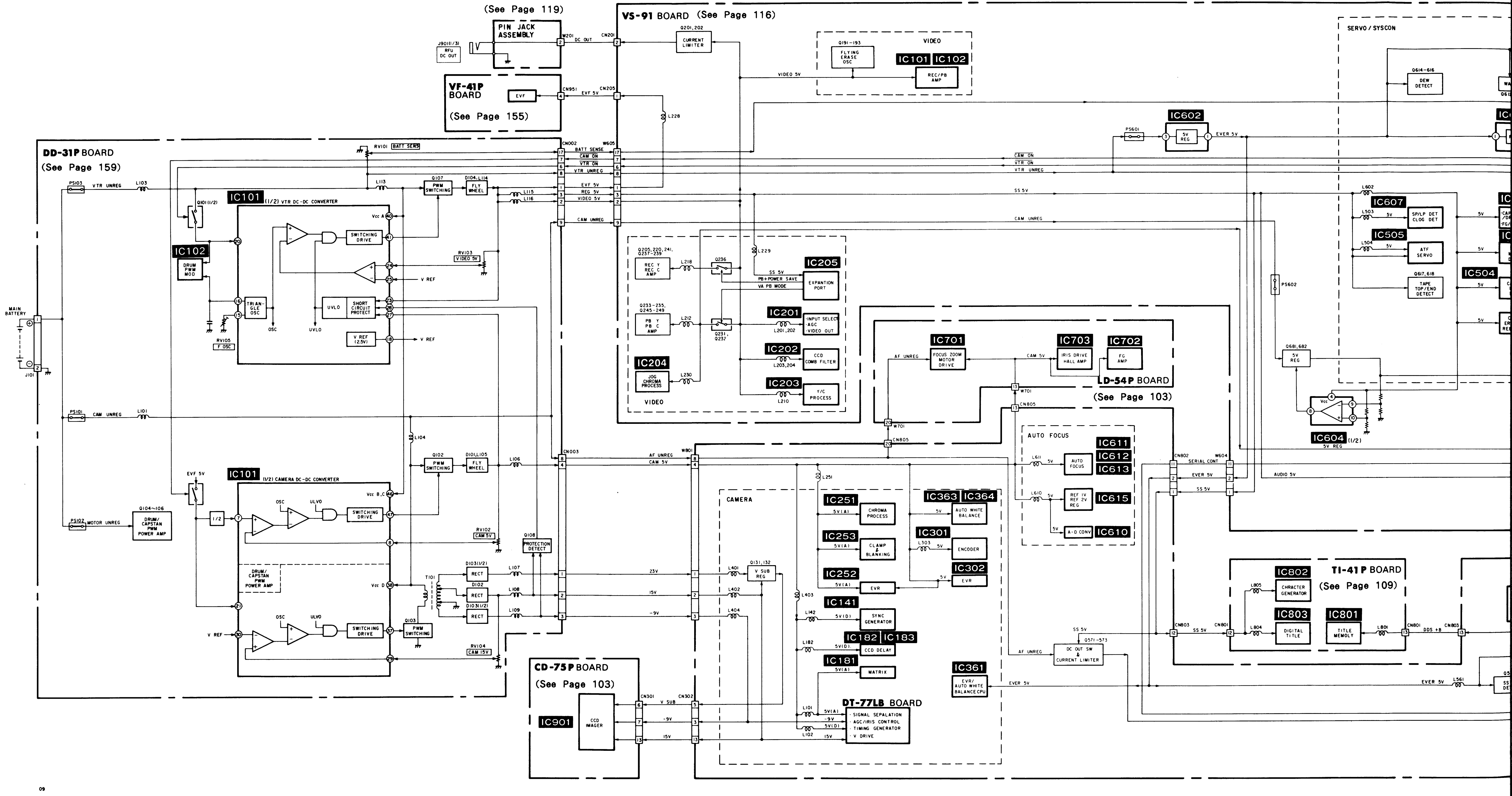
3-13. VIEWFINDER BLOCK DIAGRAM

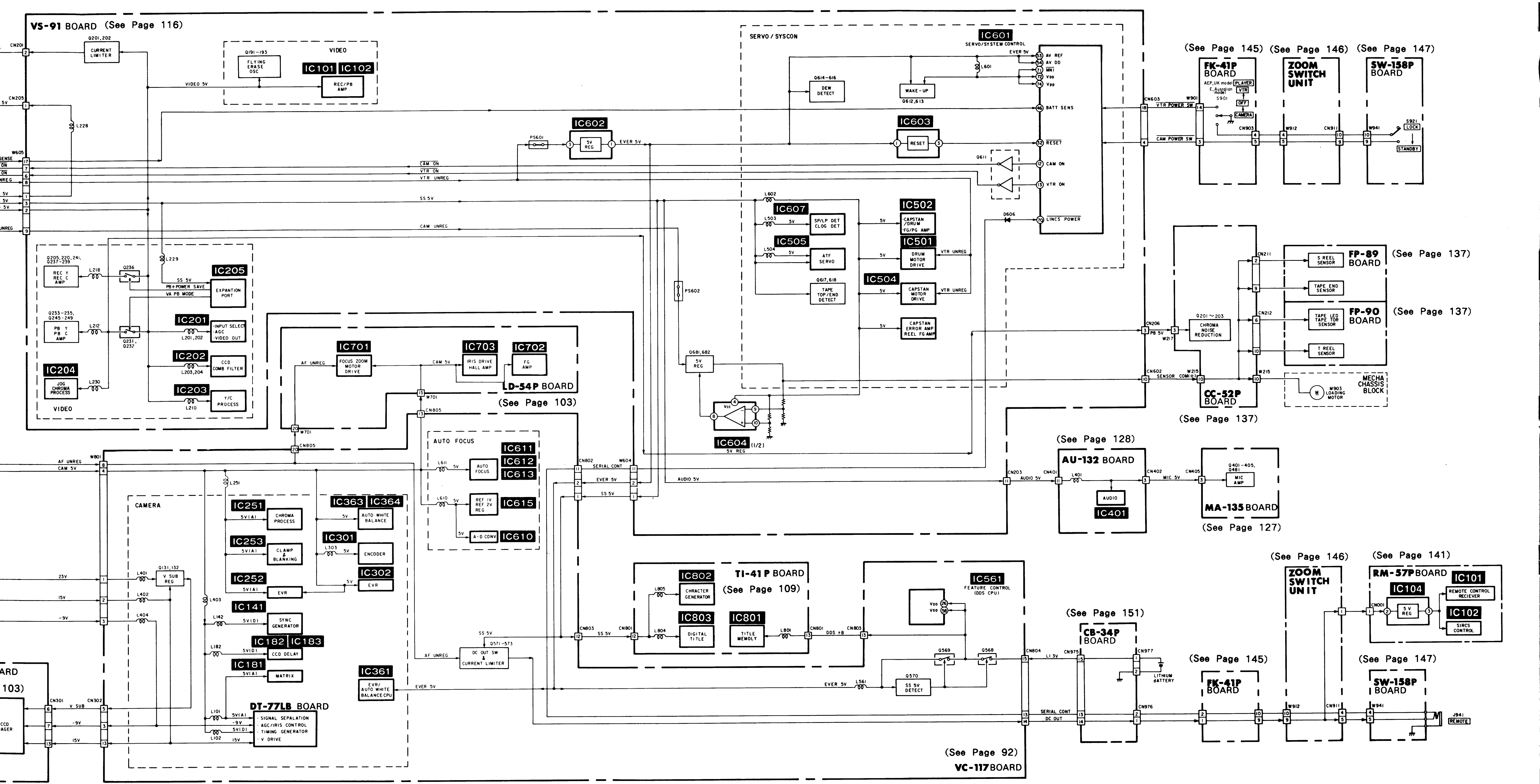

VF-41P BOARD
(See Page 155)
EVF·5V
D952 TALLY
D951 TALLY
SYSTEM CONTROL (VS-91)
VIDEO(1) (VS-91)
TALLY
EVF VIDEO
W951
4
3
IC951 ⑪ VTR REC
2.8Vp-p
H
IC951 ⑨ VTR REC
0.8Vp-p
IC951 ⑭ VTR REC
0.21Vp-p
RV953 CONTRAST
Q951 VIDEO OUT
Q954 Ⓔ
8Vp-p
T951 FBT
RV951 H FREQ
IC951
AFC
H OSC
H DRIVE
SYNC SEP
VIDEO AMP/BLKG MIX
V SYNC SEP
V OSC
V OUT
Vcc
EVF 5V
V FREQ
R962,963
C958
RV952 V SIZE
Q952 H.OUT
C961
SOL001 H SIZE
EVF +5V
D953 DUMPER
IC951 ⑤ VTR REC
1.8Vp-p
V
IC951 ③ VTR REC
1.8Vp-p

09


ARD
2.8Vp-p
H
IC951 ⑪ VTR REC
0.8Vp-p
H
51 ⑨ VTR REC
0.21Vp-p
H
IC951 ⑭ VTR REC
RV953
CONTRAST
Q951
VIDEO OUT
8Vp-p
H
Q954 Ⓔ
W951
G1
V901
PICTURE TUBE
T951 FBT
H
H
HV
EVF +5V
Q952
H.OUT
C961
SOL001
H SIZE
D953
DUMPER
RV954
FOCUS
G3
G2
RV955
BRIGHT
RV951
H FREQ
AFC
H OSC
H DRIVE
VIDEO AMP/BLKG MIX
V OSC
V OUT
1.8Vp-p
V
IC951 ⑤ VTR REC
1.8Vp-p
V
IC951 ③ VTR REC
RV952
V SIZE
V FREQ
R962,963
C958
CN953
DH2
DH1
EVF 5V
L953
HLC
L901
DEFLECTION YOKE
H
V
CN952
DV1
DV2
9
13
14
11
6
7
5
3
1
10
1
2
3
4
5
6
7
8

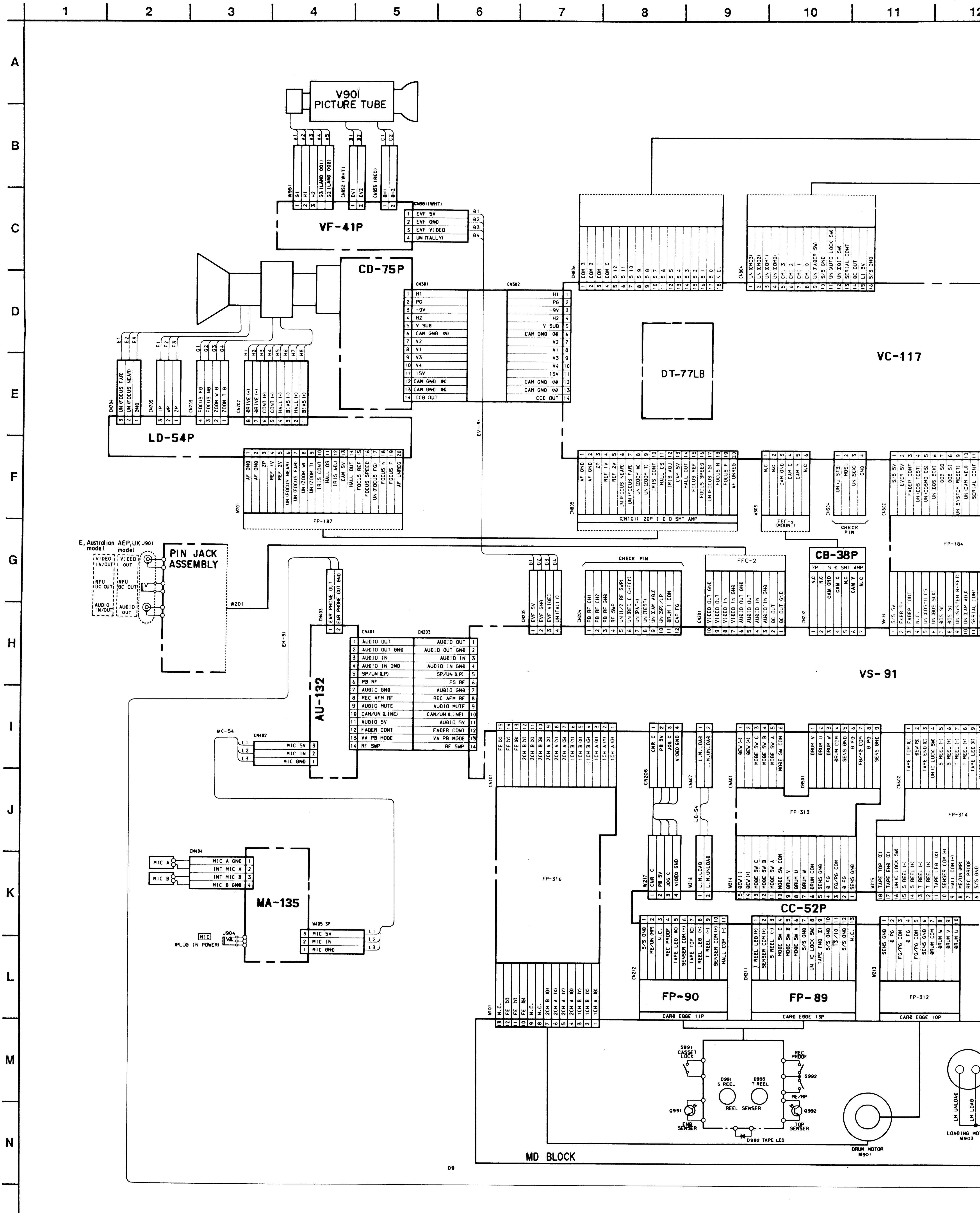
3-14. POWER BLOCK DIAGRAM


(See Page 119)
PIN JACK ASSEMBLY
J901(1/3) RFU DC OUT
DC OUT
VF-41P BOARD
(See Page 155)
EVF
EVF 5V
VS-91 BOARD (See Page 116)
Q201,202 CURRENT LIMITER
VIDEO
Q191~193 FLYING ERASE OSC
IC101 IC102 REC/PB AMP
VIDEO 5V
L228
SERVO / SYSCON
Q614~616 DEW DETECT
IC602 5V REG
PS601
EVER 5V
DD-31P BOARD
(See Page 159)
RV101 BATT SENS
BATT SENSE
CAM ON
VTR ON
VTR UNREG
EVF 5V
REG 5V
VIDEO 5V
CAM UNREG
SS 5V
PS103 VTR UNREG L103
Q101(1/2)
IC101 (1/2) VTR DC-DC CONVERTER
Q107 PWM SWITCHING
D104,L114 FLY WHEEL
L113 L115 L116
SWITCHING DRIVE
RV103 VIDEO 5V
V REF
IC102 DRUM PWM MOD
TRIANGLE OSC
UVLO
SHORT CIRCUIT PROTECT
V REF (2.5V)
RV105 F OSC
OSC
MAIN BATTERY
J101
PS101 CAM UNREG L101
L104
Q102 PWM SWITCHING
D101,L105 FLY WHEEL
L106
EVF 5V
IC101 (1/2) CAMERA DC-DC CONVERTER
1/2
ULVO
RV102 CAM 5V
Q108 PROTECTION DETECT
PS102 MOTOR UNREG
Q104~106 DRUM/CAPSTAN PWM POWER AMP
DRUM/CAPSTAN PWM POWER AMP
T101
D103(1/2) RECT
D102 RECT
D103(1/2) RECT
L107 L108 L109
Q103 PWM SWITCHING
RV104 CAM 15V
CN002 W605 CN003 W801
AF UNREG
CAM 5V
23V
15V
-9V
Q205,220,241, Q237~239 REC Y REC C AMP
L218 Q236
L229
SS 5V
PB+POWER SAVE
VA PB MODE
IC205 EXPANTION PORT
Q233~235, Q245~249 PB Y PB C AMP
L212 Q231, Q232
IC201 INPUT SELECT AGC VIDEO OUT
L201,202
IC202 CCD COMB FILTER
L203,204
IC204 JOG CHROMA PROCESS
L230
IC203 Y/C PROCESS
L210
IC701 FOCUS ZOOM MOTOR DRIVE
IC703 IRIS DRIVE HALL AMP
IC702 FG AMP
LD-54P BOARD
(See Page 103)
W701 CN805
AUTO FOCUS
IC611 IC612 IC613 AUTO FOCUS
L611 5V
L610 REF 1V REF 2V REG
IC615
A-D CONV IC610
IC607 SP/LP DET CLOG DET
L602 L503 L504
IC505 ATF SERVO
Q617,618 TAPE TOP/END DETECT
IC504
PS602
Q681,682 5V REG
IC604 (1/2) 5V REG
CN802 W604 SERIAL CONT
EVER 5V
SS 5V
AUDIO 5V
L251
CAMERA
IC251 5V(A) CHROMA PROCESS
IC253 5V(A) CLAMP & BLANKING
IC252 5V(A) EVR
IC141 5V(D) SYNC GENERATOR
L142
IC182 IC183 5V(D) CCD DELAY
L182
IC181 5V(A) MATRIX
IC363 IC364 AUTO WHITE BALANCE
IC301 L303 ENCODER
IC302 EVR
IC361 EVR/AUTO WHITE BALANCE CPU
L401 Q131,132 V SUB REG
L402 L403 L404
CD-75P BOARD
(See Page 103)
IC901 CCD IMAGER
CN301 CN302 V SUB
DT-77LB BOARD
L101 L102
SIGNAL SEPALATION
AGC/IRIS CONTROL
TIMING GENERATOR
V DRIVE
Q571~573 DC OUT SW & CURRENT LIMITER
IC802 CHRACTER GENERATOR
L805
TI-41P BOARD
(See Page 109)
IC803 DIGITAL TITLE
L804
IC801 TITLE MEMOLY
L801
CN803 CN801
DDS +B
L561
09


VS-91 BOARD (See Page 116)
CURRENT LIMITER
Q201,202
VIDEO
Q191-193
FLYING ERASE OSC
IC101 IC102
REC/PB AMP
VIDEO 5V
L228
CAM ON
VTR ON
VTR UNREG
SS 5V
CAM UNREG
Q205,220,241, Q237-239
REC Y REC C AMP
L218
Q236
L229
IC205
SS 5V
PB+POWER SAVE
VA PB MODE
EXPANTION PORT
Q233-235, Q245-249
PB Y PB C AMP
L212
Q231, Q232
IC201
·INPUT SELECT ·AGC ·VIDEO OUT
L201,202
IC202
CCD COMB FILTER
L203,204
IC204
JOG CHROMA PROCESS
L230
IC203
Y/C PROCESS
L210
VIDEO
IC701
AF UNREG
FOCUS ZOOM MOTOR DRIVE
CAM 5V
IC703
IRIS DRIVE HALL AMP
IC702
FG AMP
LD-54P BOARD
(See Page 103)
W701
CN805
CN805
AUTO FOCUS
L611
5V
AUTO FOCUS
IC611
IC612
IC613
L610
REF 1V REF 2V REG
IC615
A-D CONV
IC610
PS601
IC602
5V REG
EVER 5V
PS602
Q681,682
5V REG
IC604 (1/2)
5V REG
Vcc
SERVO / SYSCON
IC601
SERVO/SYSTEM CONTROL
EVER 5V
AV REF
AV DD
MNI
Vdd
Vpp
BATT SENS
RESET
CAM ON
VTR ON
LINCS POWER
Q614-616
DEW DETECT
L601
WAKE-UP
Q612,613
IC603
RESET
Q611
D606
L602
IC607
L503
SP/LP DET CLOG DET
IC502
·CAPSTAN /DRUM ·FG/PG AMP
IC505
L504
ATF SERVO
IC501
DRUM MOTOR DRIVE
VTR UNREG
Q617,618
TAPE TOP/END DETECT
IC504
CAPSTAN MOTOR DRIVE
CAPSTAN ERROR AMP REEL FG AMP
CN603
W901
VTR POWER SW
CAM POWER SW
(See Page 145)
FK-41P BOARD
AEP,UK model PLAYER
E, Ausralian model
VTR
OFF
CAMERA
S901
CN903
(See Page 146)
ZOOM SWITCH UNIT
W912
CN911
(See Page 147)
SW-158P BOARD
W941
S921
LOCK
STANDBY
CN206
PB 5V
W217
Q201~203
CHROMA NOISE REDUCTION
CN211
CN212
CN602
SENSOR COM
W215
CC-52P BOARD
(See Page 137)
S REEL SENSOR
TAPE END SENSOR
FP-89 BOARD
(See Page 137)
TAPE LED TAPE TOP SENSOR
T REEL SENSOR
FP-90 BOARD
(See Page 137)
M903 LOADING MOTOR
MECHA CHASSIS BLOCK
(See Page 128)
AU-132 BOARD
CN203
AUDIO 5V
CN401
L401
AUDIO
IC401
CN402
MIC 5V
CN405
Q401-405, Q481
MIC AMP
MA-135 BOARD
(See Page 127)
W801
AF UNREG
CAM 5V
CN802
SERIAL CONT
W604
EVER 5V
SS 5V
AUDIO 5V
CAMERA
L251
IC251
5V(A)
CHROMA PROCESS
IC363 IC364
AUTO WHITE BALANCE
IC253
IC301
L303
ENCODER
CLAMP & BLANKING
IC302
IC252
EVR
23V
15V
-9V
L401
L402
L404
Q131,132
V SUB REG
L403
IC141
L142
5V(D)
SYNC GENERATOR
IC182 IC183
L182
CCD DELAY
IC181
MATRIX
IC361
EVR/ AUTO WHITE BALANCE CPU
EVER 5V
L101
L102
-9V
DT-77LB BOARD
·SIGNAL SEPALATION ·AGC/IRIS CONTROL ·TIMING GENERATOR ·V DRIVE
CN301
CN302
V SUB
CCD IMAGER
ARD
103)
AF UNREG
Q571-573
DC OUT SW & CURRENT LIMITER
IC802
L805
CHRACTER GENERATOR
TI-41P BOARD
(See Page 109)
IC803
L804
DIGITAL TITLE
IC801
TITLE MEMOLY
L801
CN803
CN801
DDS +B
IC561
FEATURE CONTROL (DDS CPU)
VDD
Q569
Q568
Q570
SS 5V DETECT
L561
CN804
L1 3V
SERIAL CONT
DC OUT
(See Page 92)
VC-117 BOARD
(See Page 151)
CB-34P BOARD
CN975
CN977
LITHIUM BATTERY
CN976
(See Page 145)
FK-41P BOARD
(See Page 146)
ZOOM SWITCH UNIT
(See Page 141)
RM-57P BOARD
IC101
IC104
CN001
5V REG
REMOTE CONTROL RECIEVER
IC102
SIRCS CONTROL
(See Page 147)
SW-158P BOARD
J941
REMOTE

SECTION 4
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

4-1. FRAME SCHEMATIC DIAGRAM


1
2
3
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A
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C
D
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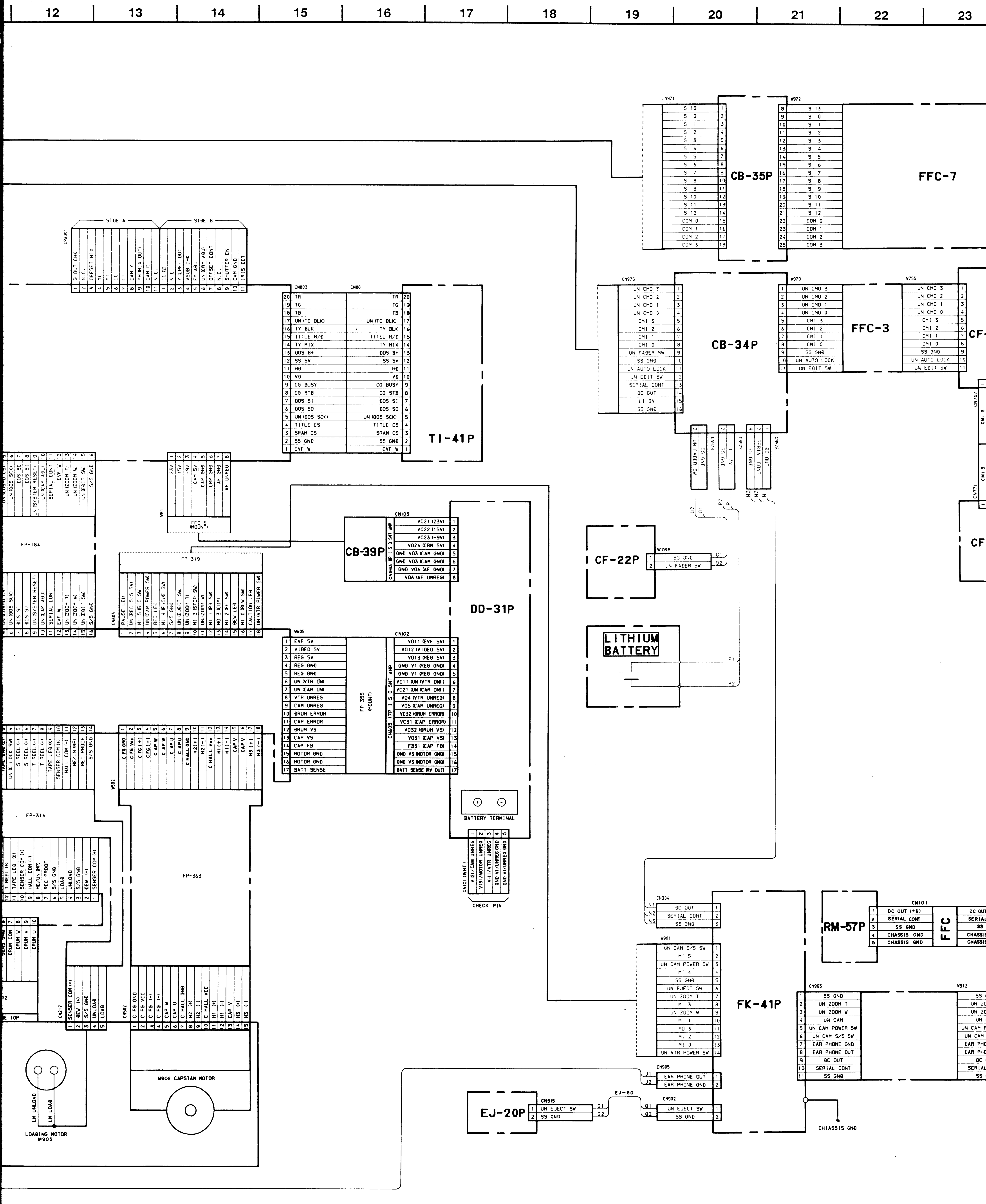
H
I
J
K
L
M
N
O
V901
PICTURE TUBE
VF-41P
CN951 (WHT)
EVF 5V
EVF GND
EVF VIDEO
UN (TALLY)
CD-75P
CN301
CN302
LD-54P
FP-187
DT-77LB
VC-117
CN806
CN804
CN805
CN101 20P 1 0 0 SMT AMP
FFC-4 (MOUNT)
CHECK PIN
CB-38P
7P 1 S 0 SMT AMP
FP-184
FFC-2
E, Australian model
AEP, UK model
J901
VIDEO IN/OUT
RFU DC OUT
AUDIO IN/OUT
PIN JACK ASSEMBLY
W201
EH-51
EV-51
AU-132
CN403
EAR PHONE OUT
EAR PHONE OUT GND
CN401
CN203
AUDIO OUT
AUDIO OUT GND
AUDIO IN
AUDIO IN GND
SP/UN (LP)
PB RF
PS RF
AUDIO GND
REC AFM RF
AUDIO MUTE
CAM/UN (LINE)
AUDIO 5V
FADER CONT
VA PB MODE
RF SWP
VS-91
MC-54
CN402
MIC 5V
MIC IN
MIC GND
CN404
MIC A
MIC B
MIC A GND
INT MIC A
INT MIC B
MIC B GND
MA-135
W405 3P
J904
MIC
(PLUG IN POWER)
CN206
CN407
LD-54
FP-313
FP-314
FP-316
CC-52P
FP-90
FP-89
FP-312
CARD EDGE 11P
CARD EDGE 13P
CARD EDGE 10P
S991 CASSET LOCK
REC PROOF
S992
D991 S REEL
D993 T REEL
REEL SENSER
Q991
END SENSER
Q992
TOP SENSER
D992 TAPE LED
DRUM MOTOR M901
LOADING MOTOR M903
MD BLOCK

FRAME FRAME


12
13
14
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16
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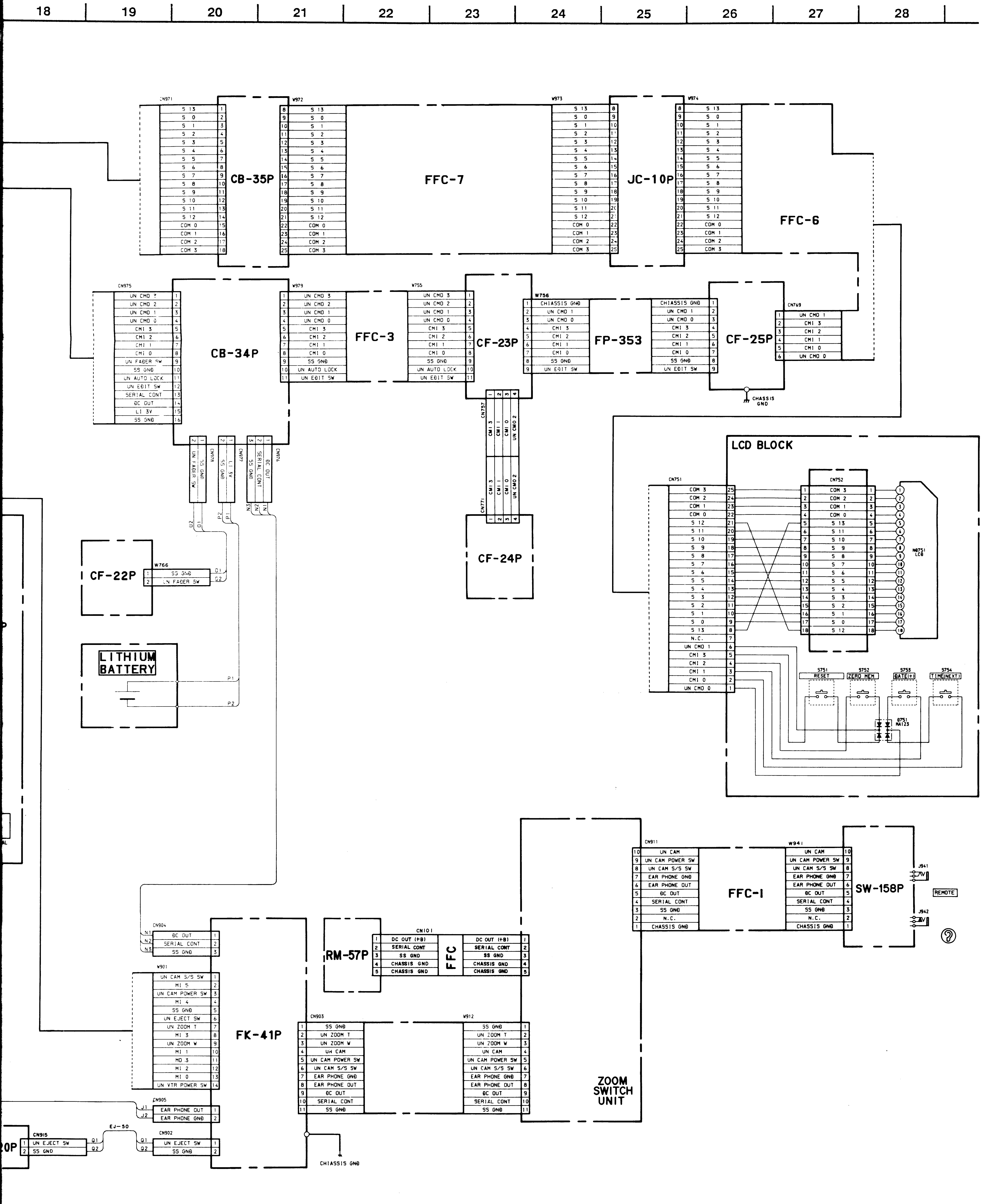
18
19
20
21
22
23
CB-35P
FFC-7
CN971
W972
CB-34P
CN975
W979
FFC-3
W755
TI-41P
CN803
CN801
CPA201
SIDE A
SIDE B
CB-39P
CN103
CN965 8P 1.5 0 SMT AMP
DD-31P
CF-22P
W766
LITHIUM BATTERY
FP-184
FP-319
FFC-5 (MOUNT)
W801
FP-355 (MOUNT)
W605
CN102
CN605 17P 1.5 0 SMT AMP
BATTERY TERMINAL
CN101 (WHT)
CHECK PIN
FP-314
FP-363
W502
CN217
CN502
M902 CAPSTAN MOTOR
LOADING MOTOR M903
LM UNLOAD
LM LOAD
FK-41P
CN904
W901
CN905
RM-57P
CN101
FFC
CN903
W912
EJ-20P
CN915
EJ-50
CN902
CHIASSIS GND

FRAME FRAME


18
19
20
21
22
23
24
25
26
27
28
CN971
W972
W973
W974
S 13
S 0
S 1
S 2
S 3
S 4
S 5
S 6
S 7
S 8
S 9
S 10
S 11
S 12
COM 0
COM 1
COM 2
COM 3
CB-35P
FFC-7
JC-10P
FFC-6
CN975
W979
W755
W756
CN769
UN CMO 3
UN CMO 2
UN CMO 1
UN CMO 0
CMI 3
CMI 2
CMI 1
CMI 0
UN FADER SW
SS GND
UN AUTO LOCK
UN EDIT SW
SERIAL CONT
DC OUT
LI 3V
CB-34P
FFC-3
CF-23P
CHIASSIS GND
FP-353
CF-25P
CHASSIS GND
CN757
CN771
UN CMO 2
CF-24P
CN978
CN977
CN976
U2
U1
P2
P1
N3
N2
N1
CF-22P
W766
SS GND
UN FADER SW
LITHIUM BATTERY
LCD BLOCK
CN751
CN752
N.C.
ND751 LCD
S751 RESET
S752 ZERO MEM
S753 DATE(+)
S754 TIME(NEXT)
D751 MA123
CN911
W941
UN CAM
UN CAM POWER SW
UN CAM S/S SW
EAR PHONE GND
EAR PHONE OUT
DC OUT
SERIAL CONT
SS GND
N.C.
CHASSIS GND
FFC-1
SW-158P
J941
J942
REMOTE
⑦
CN101
RM-57P
DC OUT (+B)
SERIAL CONT
SS GND
CHASSIS GND
FFC
CN904
CN903
W912
W901
UN CAM S/S SW
MI 5
UN CAM POWER SW
MI 4
SS GND
UN EJECT SW
UN ZOOM T
MI 3
UN ZOOM W
MI 1
MO 3
MI 2
MI 0
UN VTR POWER SW
FK-41P
ZOOM SWITCH UNIT
CN905
J1
J2
EAR PHONE OUT
EAR PHONE GND
CN915
EJ-50
CN902
Q1
Q2
UN EJECT SW
0P
CHIASSIS GND

FRAME FRAME

A-7062-993-A VC-117 BOARD, COMPLETE
****

(DIODE)

D101	8-719-404-46	DIODE	MA110-TX
D102	8-719-404-46	DIODE	MA110-TX
D131	8-719-820-05	DIODE	1SS181
D132	8-719-404-46	DIODE	MA110-TX
D141	8-719-949-46	DIODE	1T32
D142	8-719-949-46	DIODE	1T32
D301	8-719-404-46	DIODE	MA110-TX
D361	8-719-820-05	DIODE	1SS181
D362	8-719-404-46	DIODE	MA110-TX
D561	8-719-404-49	DIODE	MA111-TX
D562	8-719-420-51	DIODE	MA729-TX
D563	8-719-404-46	DIODE	MA110-TX

IC141	8
IC181	8
IC182	8
IC183	8
IC251	8
IC252	8
IC253	8
IC301	8
IC302	8
IC361	8
IC362	8
IC363	8
IC364	8
IC561	8
IC610	8
IC611	8
IC612	8
IC613	8
IC615	8

4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS.
(In addition to this , the necessary note is printed in each block.)

- **For printed wiring boards.**
- ○— : indicated a lead wire mounted on the component side.
- —— : indicated a lead wire mounted on the conductor side.
- ■ : Parts mounted on the conductor side.
- ▓ : Pattern from the side which enables seeing.
- ░ : Pattern of the rear side.

(The inner two layers' patterns are not indicated.)

- Circled numbers refer to waveforms.
- (B) or (F), etc. of capacitors indicate the temperature characteristics.
- ● : Through hole

Caution:

Pattern face side: (Conductor Side)	Parts on the pattern face side seen from the pattern face are indicated.
Parts face side: (Component side)	Parts on the parts face side seen from the parts face are indicated.

- **For schematic diagrams.**
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minuts side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted.
  Chip resistor are 1/16W unless otherwise noted.
  kΩ : 1000Ω , MΩ : 1000kΩ .
- All capacitors are in μF unless otherwise noted. pF: μμF.
  50V or less are not indicated except for electrolytics and tantalums.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ⊡ : nonflammable resistor.
- ∿ : fusible resistor.
- ▭ : panel designation.
- △ : internal component.
- ▭ : adjustment for repeair.
- ━━ : B+ Line.
- ‐‐‐‐ : B– Line.
- ⇒ : IN/OUT direction of (+, –) B LINE.
- Circled numbers refer to waveforms.

Note:
The components identi- fied by mark ⚠ or dotted line with mark ⚠ are critical for safty.
Replace only with part number specified.

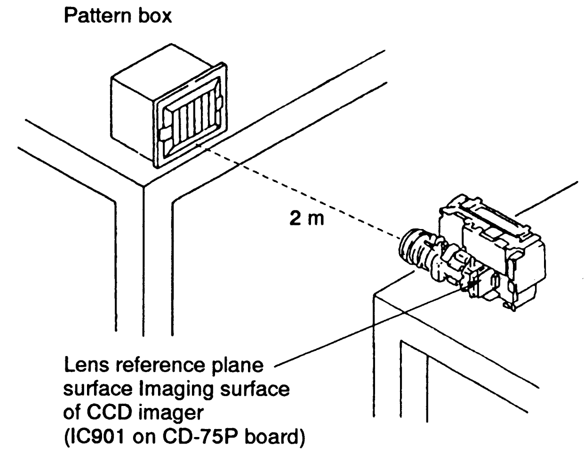
When indicating parts by refer- ence number, please include the board name.

- **Measuring conditions voltage value and waveform.**

(CAMERA, DIGITAL TITLE block)

- The object is color bar chart of pattern box.
- Voltages are dc between ground and measurement points. Readings are taken with a digital multimeter (DC 10MΩ).
- Voltage variations may be noted due to normal production tolerances.

1. Connection



2. Adjust the distance so that the output waveform of Fig. a and the Fig. b can be obtain.

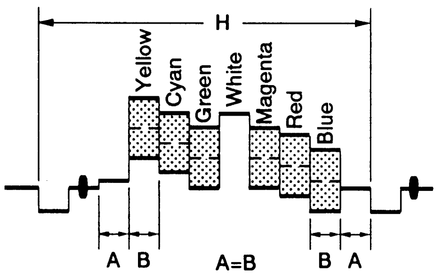


Fig. a (Video output terminal output waveform)

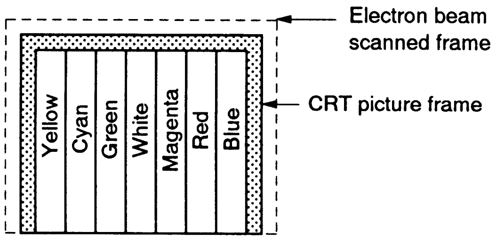


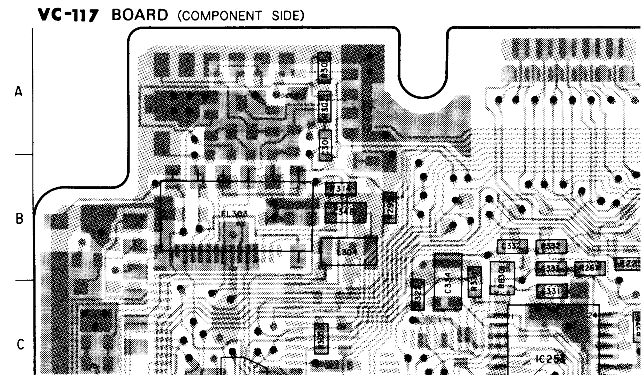
Fig. b (Picture on monitor TV)

(VIDEO, SERVO/SYSTEM CONTROL, MODE CONTROL, AUDIO, VIEW FINDER block)

- Voltages are dc between ground and measurement points.
- Readings are taken with a color-bar signal input.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.

VC-117 (CAMERA), CB-35P (BOARD LINK), CB-39P (E

— Ref. No. VC-117 BOARD: 10000, CB-35P BOARD: 6000, CB-39P BOAF



(IC)

IC141	8-752-335-85	IC	CXD2109Q
IC181	8-752-034-17	IC	CXA1338R
IC182	8-752-330-15	IC	CXL1503N
IC183	8-752-332-69	IC	CXL5504M
IC251	8-752-034-21	IC	CXA1339R
IC252	8-759-946-00	IC	MB88341PFV
IC253	8-752-039-49	IC	CXA1393AN
IC301	8-752-033-34	IC	CXA1072R
IC302	8-759-064-35	IC	MB88346BPFV-EF
IC361	8-759-037-60	IC	MC68HC05N4-SC406667
IC362	8-759-937-56	IC	S-8054ALB-LM-S
IC363	8-759-008-67	IC	MC14066BF
IC364	8-759-998-96	IC	LM324D
IC561	8-759-154-07	IC	uPD7503GF-J59-3B8
IC610	8-752-334-49	IC	CXD1172AM
IC611	8-759-521-09	IC	MB88346APFV-EF
IC612	8-752-326-18	IC	CXD1204R
IC613	8-759-038-59	IC	MC68HC05C4-SC403112
IC615	8-759-998-98	IC	LM358D

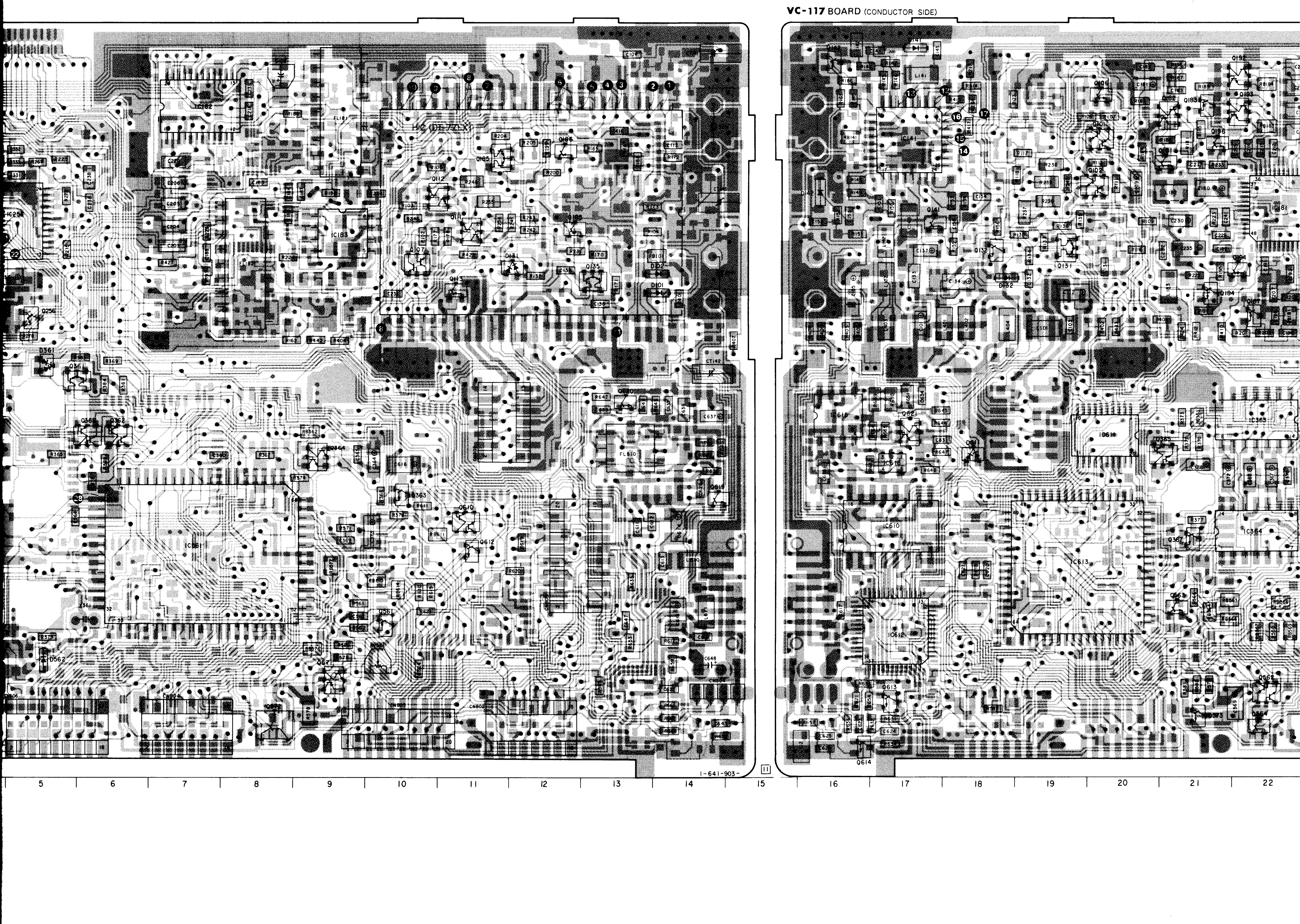
(TRANSISTOR)

Q101	8-729-907-46	TRANSISTOR	IMZ1
Q102	8-729-907-46	TRANSISTOR	IMZ1
Q106	8-729-140-63	TRANSISTOR	2SA1611-M5M6
Q107	8-729-907-46	TRANSISTOR	IMZ1
Q111	8-729-907-46	TRANSISTOR	IMZ1
Q112	8-729-907-46	TRANSISTOR	IMZ1
Q113	8-729-921-58	TRANSISTOR	DTA144TU
Q131	8-729-402-13	TRANSISTOR	XN1501-TX
Q132	8-729-117-32	TRANSISTOR	2SC4177
Q135	8-729-902-96	TRANSISTOR	FMS1
Q141	8-729-117-32	TRANSISTOR	2SC4177
Q142	8-729-117-32	TRANSISTOR	2SC4177
Q181	8-729-117-32	TRANSISTOR	2SC4177
Q182	8-729-925-42	TRANSISTOR	IMT2
Q183	8-729-140-63	TRANSISTOR	2SA1611-M5M6
Q184	8-729-117-32	TRANSISTOR	2SC4177
Q185	8-729-402-13	TRANSISTOR	XN1501-TX
Q186	8-729-140-63	TRANSISTOR	2SA1611-M5M6
Q187	8-729-140-63	TRANSISTOR	2SA1611-M5M6
Q188	8-729-117-32	TRANSISTOR	2SC4177
Q189	8-729-140-63	TRANSISTOR	2SA1611-M5M6
Q190	8-729-117-32	TRANSISTOR	2SC4177
Q191	8-729-925-42	TRANSISTOR	IMT2
Q192	8-729-925-42	TRANSISTOR	IMT2
Q193	8-729-925-42	TRANSISTOR	IMT2
Q194	8-729-140-63	TRANSISTOR	2SA1611-M5M6
Q195	8-729-140-63	TRANSISTOR	2SA1611-M5M6
Q196	8-729-117-32	TRANSISTOR	2SC4177
Q255	8-729-907-46	TRANSISTOR	IMZ1
Q256	8-729-905-18	TRANSISTOR	DTC144EU
Q257	8-729-907-46	TRANSISTOR	IMZ1
Q302	8-729-140-63	TRANSISTOR	2SA1611-M5M6
Q303	8-729-140-63	TRANSISTOR	2SA1611-M5M6
Q305	8-729-117-32	TRANSISTOR	2SC4177
Q310	8-729-117-32	TRANSISTOR	2SC4177
Q311	8-729-117-32	TRANSISTOR	2SC4177
Q312	8-729-117-32	TRANSISTOR	2SC4177
Q313	8-729-902-96	TRANSISTOR	FMS1
Q314	8-729-907-46	TRANSISTOR	IMZ1
Q315	8-729-140-63	TRANSISTOR	2SA1611-M5M6
Q361	8-729-403-07	TRANSISTOR	XN1213
Q362	8-729-403-10	TRANSISTOR	XN6215
Q363	8-729-117-32	TRANSISTOR	2SC4177
Q364	8-729-403-10	TRANSISTOR	XN6215
Q365	8-729-925-42	TRANSISTOR	IMT2
Q367	8-729-117-32	TRANSISTOR	2SC4177
Q368	8-729-403-10	TRANSISTOR	XN6215
Q561	8-729-140-63	TRANSISTOR	2SA1611-M5M6
Q562	8-729-403-24	TRANSISTOR	XN4210
Q563	8-729-905-18	TRANSISTOR	DTC144EU
Q564	8-729-921-08	TRANSISTOR	DTC144TU
Q565	8-729-925-42	TRANSISTOR	IMT2
Q566	8-729-402-19	TRANSISTOR	XN6501
Q567	8-729-925-42	TRANSISTOR	IMT2
Q568	8-729-109-44	TRANSISTOR	2SK94
Q569	8-729-140-63	TRANSISTOR	2SA1611-M5M6
Q570	8-729-905-15	TRANSISTOR	DTC144WU
Q571	8-729-920-39	TRANSISTOR	IMT-1US
Q572	8-729-805-25	TRANSISTOR	2SB1121
Q573	8-729-905-18	TRANSISTOR	DTC144EU
Q610	8-729-403-10	TRANSISTOR	XN6215
Q612	8-729-921-08	TRANSISTOR	DTC144TU
Q613	8-729-117-32	TRANSISTOR	2SC4177
Q614	8-729-117-32	TRANSISTOR	2SC4177
Q619	8-729-117-32	TRANSISTOR	2SC4177
Q620	8-729-117-32	TRANSISTOR	2SC4177
Q621	8-729-402-19	TRANSISTOR	XN6501

B-39P (BOARD LINK), JC-10P (BOARD LINK), LCD BLOCK PRINTED WIRING BOARDS

B-39P BOARD: 7000, JC-10P BOARD: 1000 series —

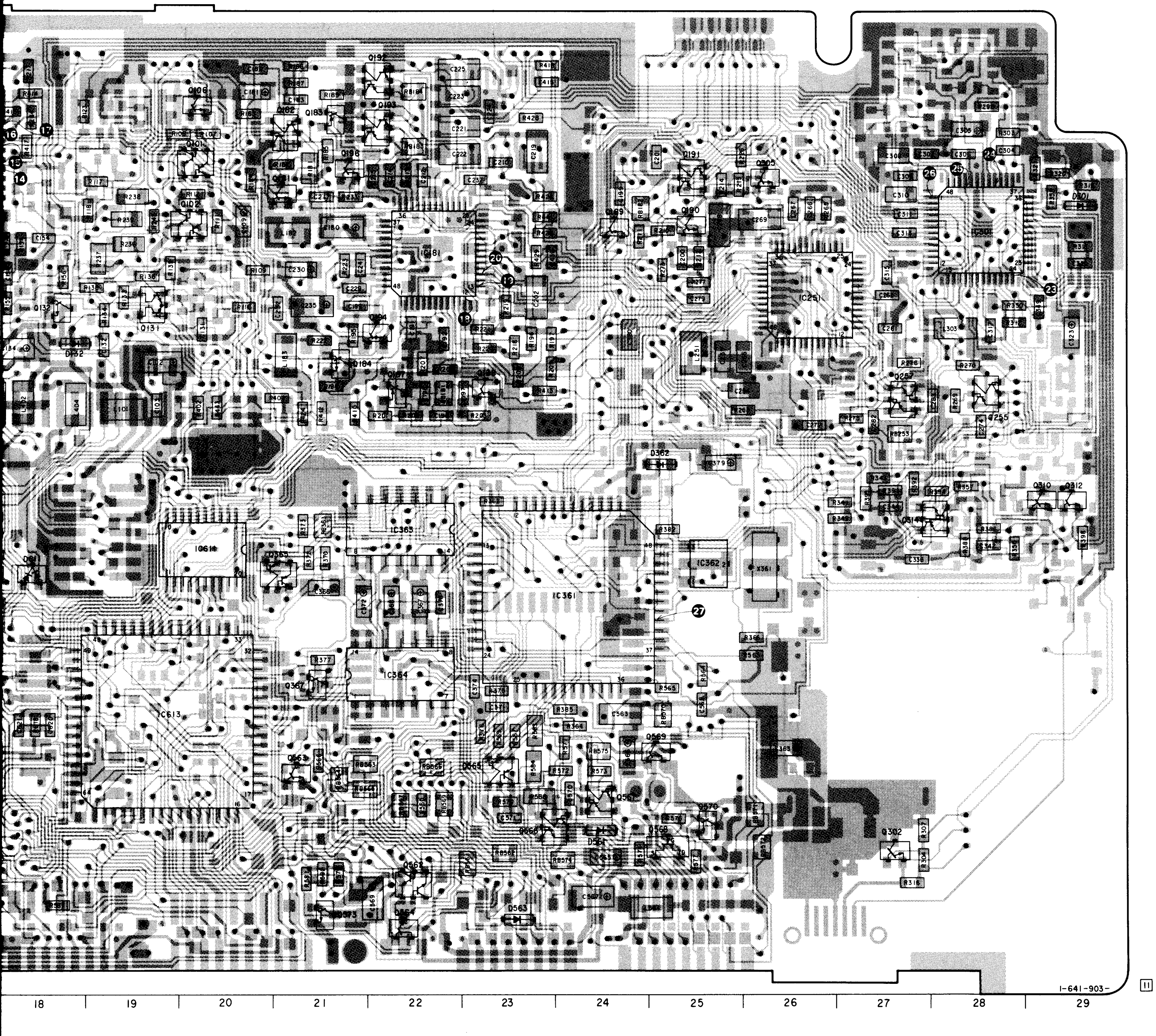
- **For printed wiring boards.**
- VC-117, CB-39P boards are the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- LCD Block is replaced as blocks, so that there PRINTED WIRING BOARDS are omitted.



M6	Q564	8-729-921-08	TRANSISTOR	DTC144TU
M6	Q565	8-729-925-42	TRANSISTOR	IMT2
	Q566	8-729-402-19	TRANSISTOR	XN6501
	Q567	8-729-925-42	TRANSISTOR	IMT2
	Q568	8-729-109-44	TRANSISTOR	2SK94
	Q569	8-729-140-63	TRANSISTOR	2SA1611-M5M6
M6	Q570	8-729-905-15	TRANSISTOR	DTC144WU
M6	Q571	8-729-920-39	TRANSISTOR	IMT-1US
	Q572	8-729-805-25	TRANSISTOR	2SB1121
	Q573	8-729-905-18	TRANSISTOR	DTC144EU
	Q610	8-729-403-10	TRANSISTOR	XN6215
	Q612	8-729-921-08	TRANSISTOR	DTC144TU
	Q613	8-729-117-32	TRANSISTOR	2SC4177
	Q614	8-729-117-32	TRANSISTOR	2SC4177
M6	Q619	8-729-117-32	TRANSISTOR	2SC4177
	Q620	8-729-117-32	TRANSISTOR	2SC4177
	Q621	8-729-402-19	TRANSISTOR	XN6501

M6

rd which has
re omitted.
re PRINTED


IC251
IC361
IC362
IC363
IC364
IC613
IC611
Q562
Q563
Q565
Q567
Q568
Q569
Q570
Q571
Q572
Q610
Q612
1-641-903-
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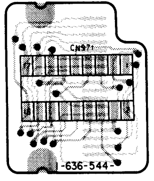
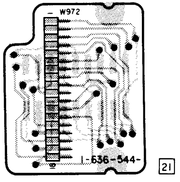
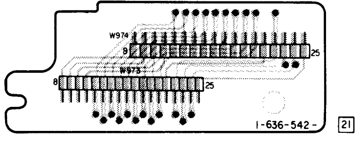
CB-35P BOARD
(COMPONENT SIDE)


CN971
1-636-544-
21

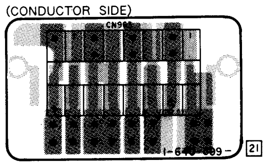
CB-35P BOARD
(CONDUCTOR SIDE)


W972
1-636-544-
21

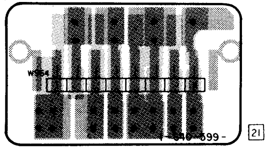
JC-10P BOARD(CONDUCTOR SIDE)


W974
W973
25
1-636-542-
21

CB-39P
(CONDUCTOR SIDE)


CN981
1-640-899-
21

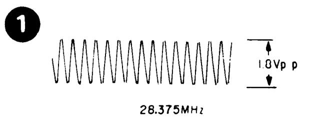
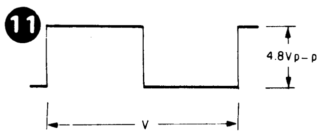
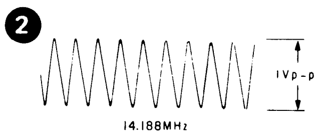
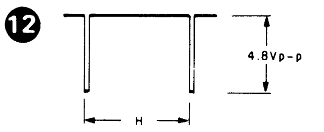
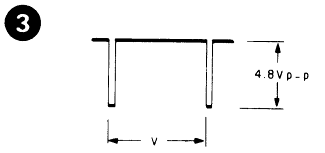
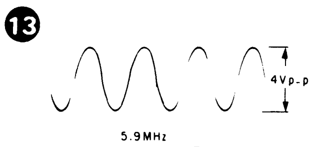
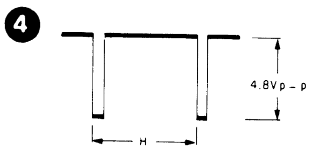
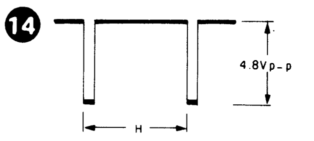
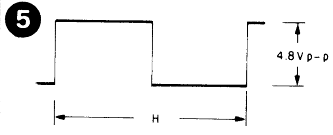
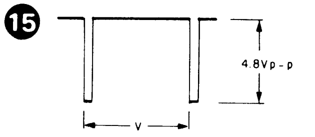
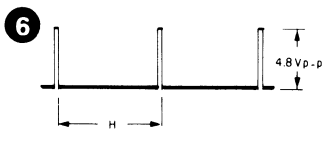
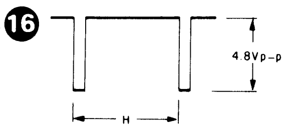
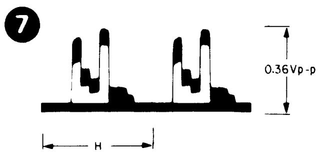
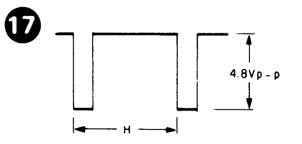
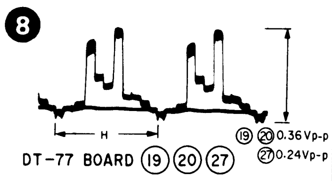
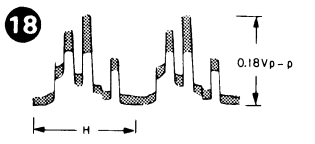
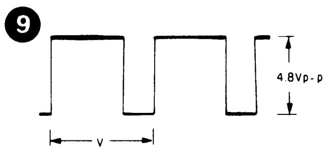
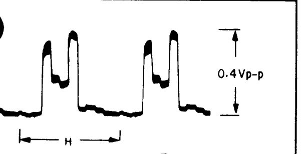
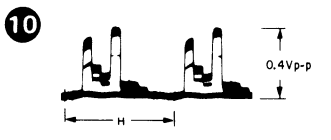
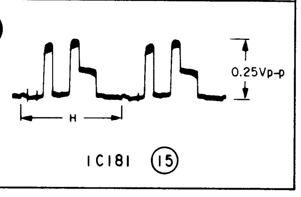
CB-39P BOARD
(COMPONENT SIDE)


W981
1-640-899-
21

- **SIGNAL PATH**

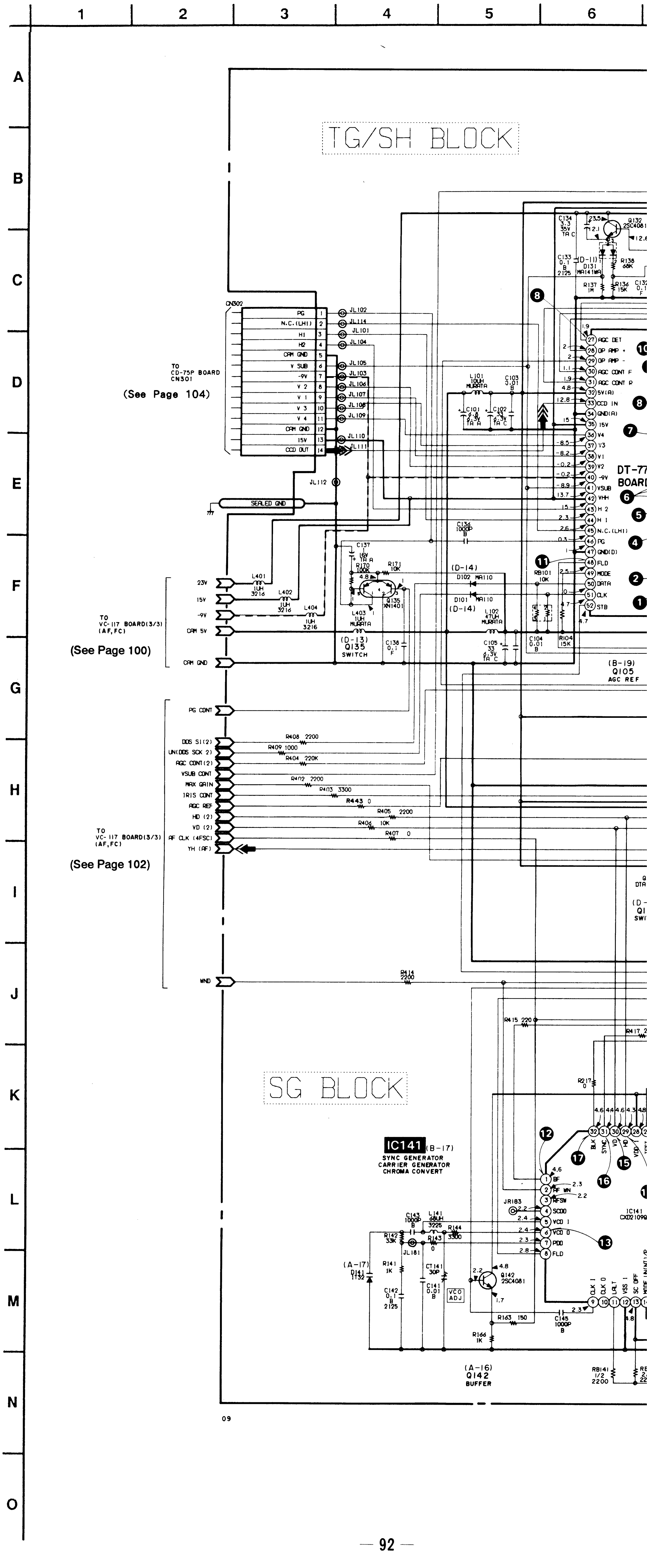
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡»»	
PB				

VC-117 BOARD(1/3)

❶  DT-77 BOARD ②	⓫  DT-77 BOARD (48)
❷  DT-77 BOARD ③	⓬  IC141 ①
❸  DT-77 BOARD ⑥	⓭  IC141 ⑥
❹  DT-77 BOARD ⑦	⓮  IC141 ㉙
❺  DT-77 BOARD ⑨	⓯  IC141 ㉚
❻  DT-77 BOARD ⑩⑪⑫	⓰  IC141 ㉛
❼  DT-77 BOARD ⑱	⓱  IC141 ㉜
❽  DT-77 BOARD ⑲⑳㉗	⓲  IC181 ⑫
❾  DT-77 BOARD ㉓	⓳  IC181 ⑬
❿  DT-77 BOARD ㉕	⓴  IC181 ⑮

VC-117 (CAMERA) SCHEMATIC DIAGRAM

— Ref. No. VC-117 BOARD: 10000 series —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D
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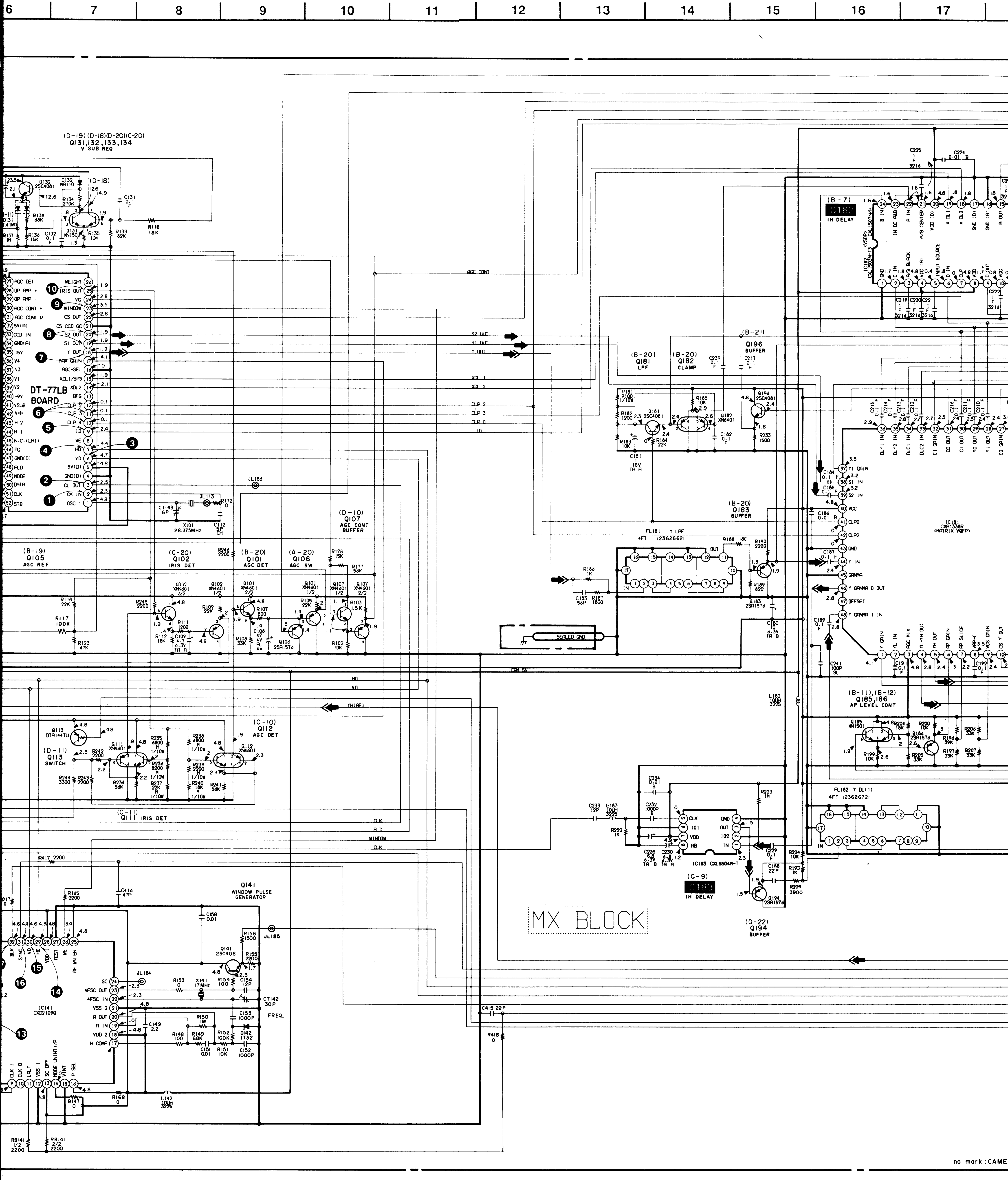
I
J
K
L
M
N
O
TG/SH BLOCK
SG BLOCK
CN302
TO CD-75P BOARD CN301
(See Page 104)
TO VC-117 BOARD(3/3) (AF,FC)
(See Page 100)
TO VC-117 BOARD(3/3) (AF,FC)
(See Page 102)
SEALED GND
(D-13) Q135 SWITCH
(B-19) Q105 AGC REF
IC141 (B-17) SYNC GENERATOR CARRIER GENERATOR CHROMA CONVERT
(A-16) Q142 BUFFER
VCO ADJ
DT-77 BOARD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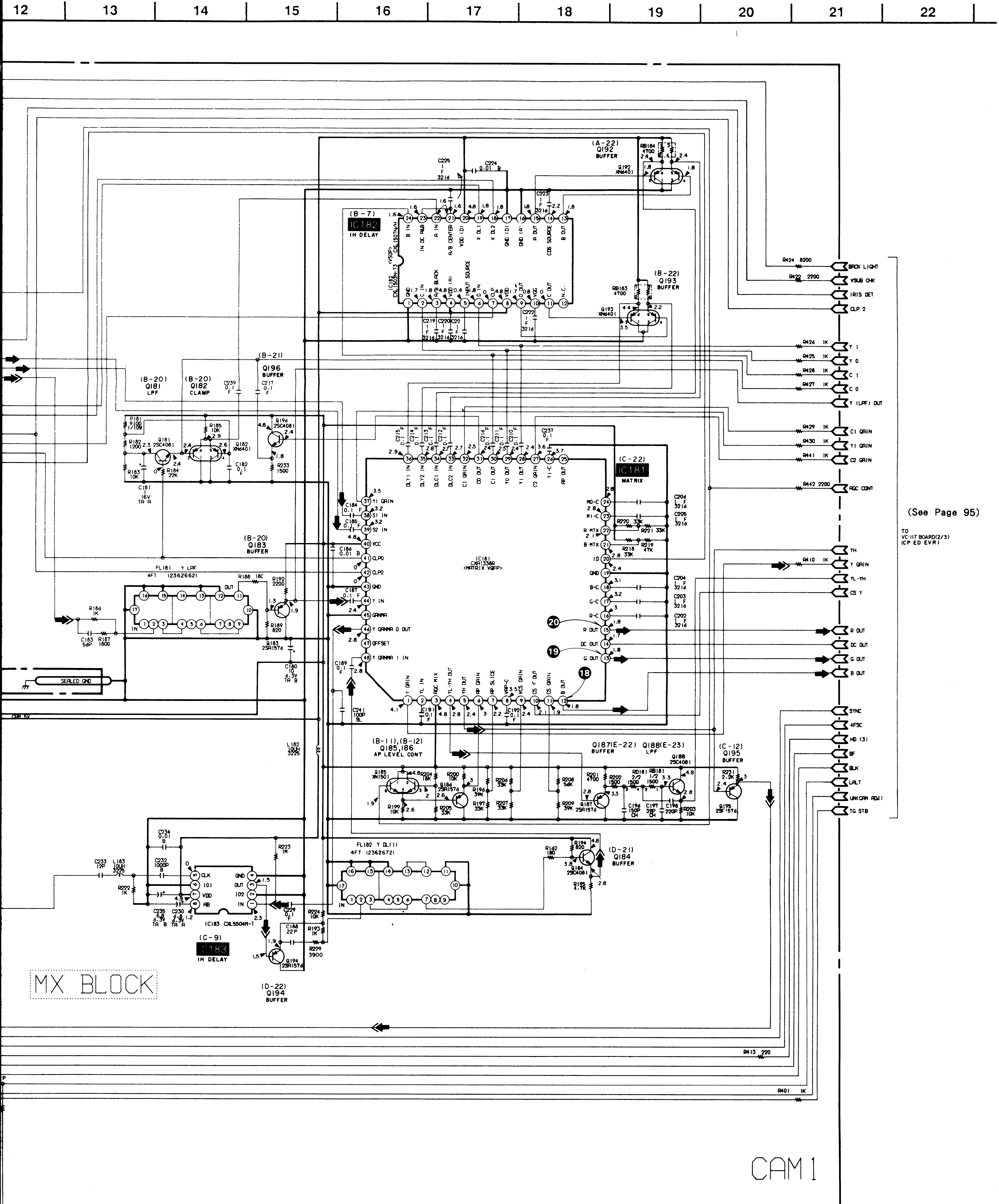
(D-19) (D-18)(D-20)(C-20)
Q131,132,133,134
V SUB REG
DT-77LB
BOARD
(B-19)
Q105
AGC REF
(C-20)
Q102
IRIS DET
(B-20)
Q101
AGC DET
(A-20)
Q106
AGC SW
(D-10)
Q107
AGC CONT
BUFFER
X101
28.375MHz
(D-11)
Q113
SWITCH
(C-10)
Q112
AGC DET
(C-11)
Q111 IRIS DET
Q141
WINDOW PULSE
GENERATOR
IC141
CXD2109Q
X141
17MHz
AGC CONT
S2 OUT
S1 OUT
Y OUT
XDL 1
XDL 2
CLP 2
CLP 3
CLP 0
ID
CAM 5V
HD
VD
YH(AF)
CLK
FLD
WINDOW
SEALED GND
(B-20)
Q181
LPF
(B-20)
Q182
CLAMP
(B-21)
Q196
BUFFER
(B-20)
Q183
BUFFER
FL181 Y LPF
(B-7)
IC182
1H DELAY
IC181
CXA1338R
(MATRIX VQFP)
(B-11),(B-12)
Q185,186
AP LEVEL CONT
FL182 Y DL(1)
IC183 CXL5504M-1
(C-9)
IC183
1H DELAY
(D-22)
Q194
BUFFER
MX BLOCK
no mark : CAME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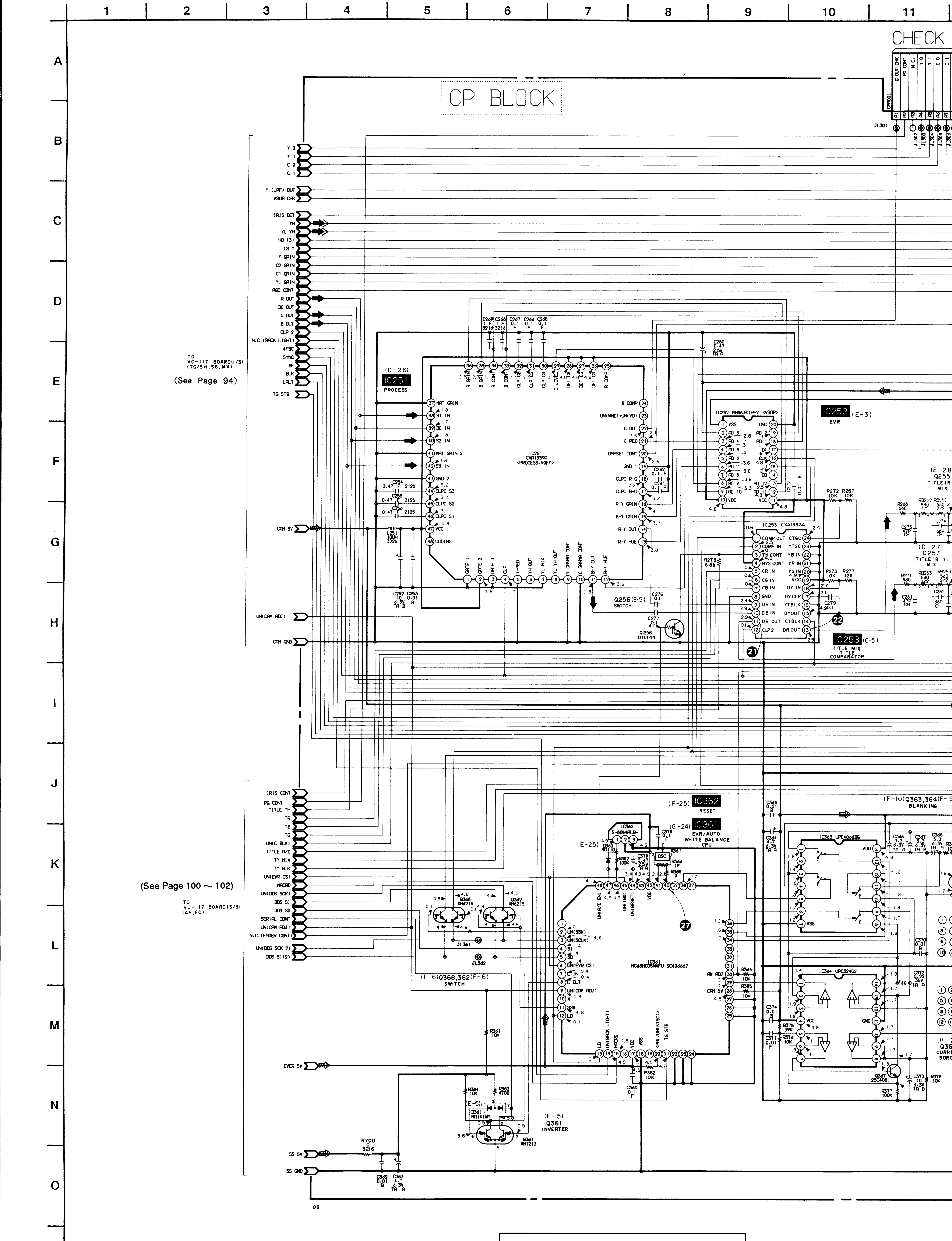
(A-22) Q192 BUFFER
(B-7) IC182 1H DELAY
IC182 CXL1507N/M
(B-22) Q193 BUFFER
(B-20) Q181 LPF
(B-20) Q182 CLAMP
(B-21) Q196 BUFFER
(B-20) Q183 BUFFER
FL181 Y LPF
(C-22) IC181 MATRIX
IC181 CXA1338R (MATRIX VQFP)
SEALED GND
(B-11),(B-12) Q185,186 AP LEVEL CONT
Q187(E-22) BUFFER
Q188(E-23) LPF
(C-12) Q195 BUFFER
FL182 Y DL(1)
(D-21) Q184 BUFFER
IC183 CXL5504M-T
(C-9) IC183 1H DELAY
(D-22) Q194 BUFFER
MX BLOCK
BACK LIGHT
VSUB CHK
IRIS DET
CLP 2
Y 1
Y 0
C 1
C 0
Y (LPF) OUT
C1 GAIN
Y1 GAIN
C2 GAIN
AGC CONT
YH
Y GAIN
YL-YH
CS Y
R OUT
DC OUT
G OUT
B OUT
SYNC
4FSC
HD (3)
BF
BLK
LALT
UNKCAN ADJ1
TG STB
(See Page 95)
TO VC-117 BOARD(2/3) (CP ED EVR)
CAM 1

no mark : CAMERA REC mode

VC-117 BOARD (1/3)
(TG/SH, SG, MX)

VC-117 (CAMERA) SCHEMATIC DIAGRAM

— Ref. No. VC-117 BOARD: 10000 series —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M
N
O
CHECK
CP BLOCK
TO VC-117 BOARD(1/3) (TG/SH, SG, MX)
(See Page 94)
(See Page 100 ~ 102)
TO VC-117 BOARD(3/3) (AF, FC)
Y 0
Y 1
C 0
C 1
Y (LPF) OUT
VSUB CHK
IRIS DET
YH
YL-YH
HD (3)
CS Y
Y GAIN
C2 GAIN
C1 GAIN
Y1 GAIN
AGC CONT
R OUT
DC OUT
G OUT
B OUT
CLP 2
N.C.(BACK LIGHT)
4FSC
SYNC
BF
BLK
LALT
TG STB
CAM 5V
UN(CAM ADJ)
CAM GND
IRIS CONT
PG CONT
TITLE TH
TR
TB
TG
UN(C BLK)
TITLE R/D
TY MIX
TY BLK
UN(EVR CS)
MACRO
UN(DDS SCK)
DDS SI
DDS SO
SERIAL CONT
UN(CAM ADJ)
N.C.(FADER CONT)
UN(DDS SCK 2)
DDS SI(2)
EVER 5V
SS 5V
SS GND
(D-26) IC251 PROCESS
IC251 CXA1339R <PROCESS.VQFP>
IC252 (E-3) EVR
IC252 MB88341PFV <VSOP>
IC253 CXA1393A
IC253 (C-5) TITLE MIX, TITLE COMPARATOR
Q256 (E-5) SWITCH
Q256 DTC144
(E-28) Q255 TITLE(R-Y) MIX
(D-27) Q257 TITLE(B-Y) MIX
(F-25) IC362 RESET
(G-24) IC361 EVR/AUTO WHITE BALANCE CPU
IC362 S-8054ALB
IC361 MC68HC05N4FU-SC406667
(E-25)
(F-6) Q368,362 (F-6) SWITCH
Q368 XN4215
Q362 XN4215
JL361
JL362
(E-5) Q361 INVERTER
Q361 XN1213
(E-5) D361 MA141WA
(F-10) Q363,364 BLANKING
IC363 UPC4066BG
IC364 UPC324G2
Q367 2SC4081
CN001
JL301
R700 0 3216
C362 0.01 B
C363 4.7 6.3V TA A
L251 10UH 3225
R361 10K
R364 10K
R363 4700
R362 10K
R364 10K
R365 10K
R375 39K
R376 10K
R377 100K
R272 10K
R267 10K
R273 10K
R277 12K
R278 6.8K
21
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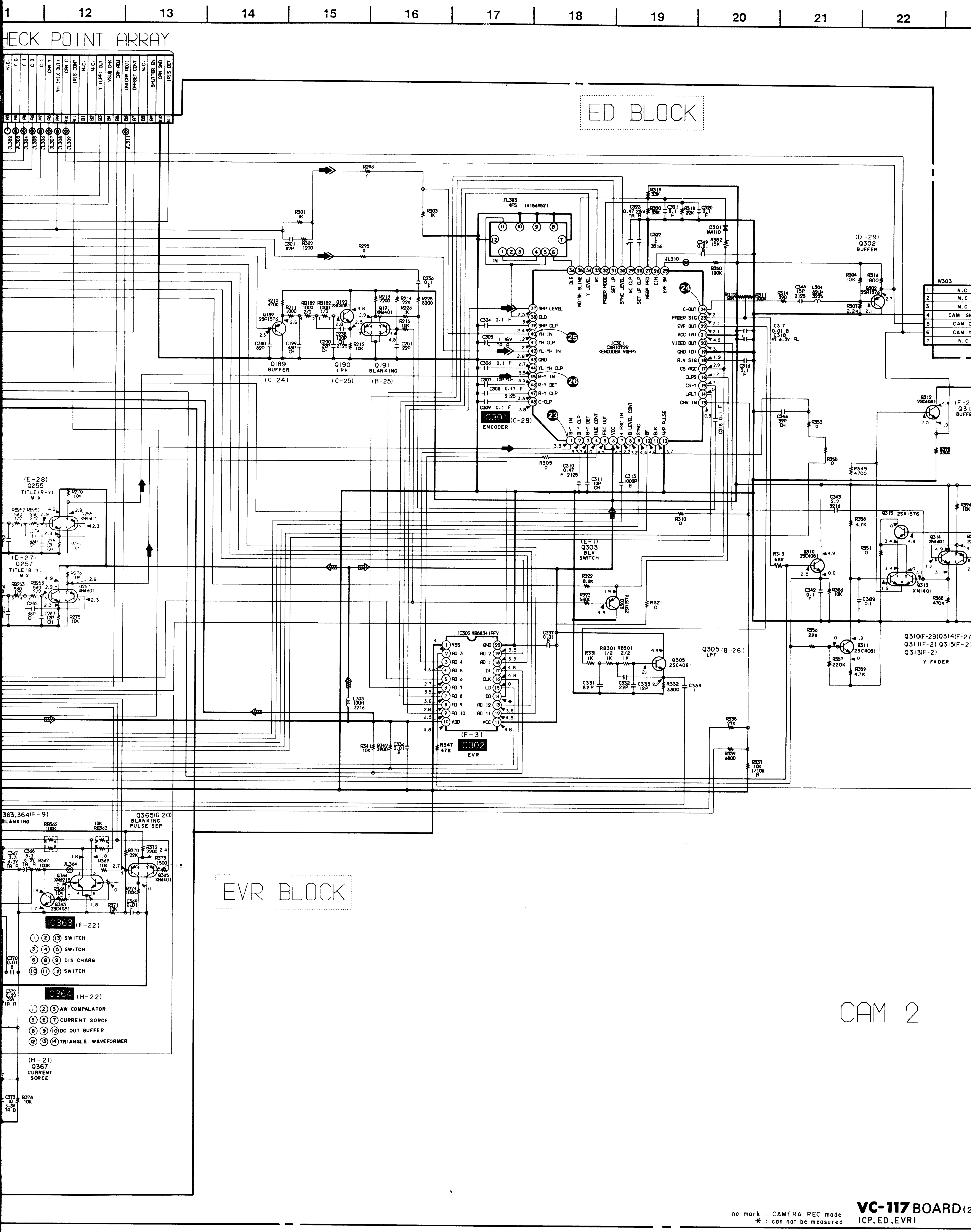
27
09

CAMERA **CAMERA**



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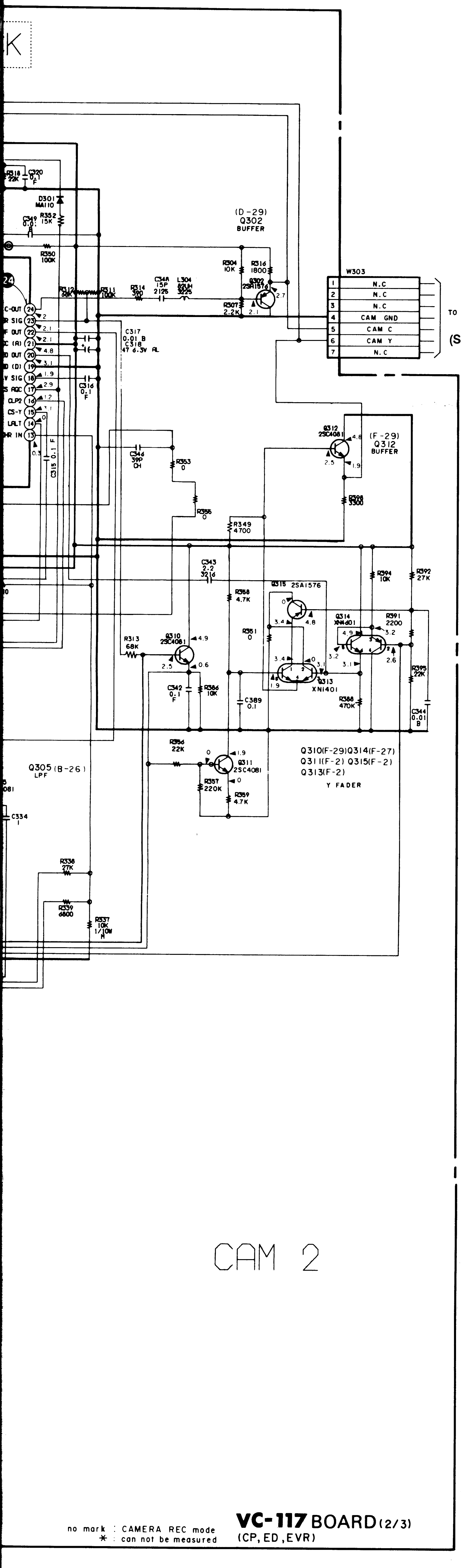
22
HECK POINT ARRAY
ED BLOCK
EVR BLOCK
CAM 2
FL303 4FS 1415d9521
IC301 CXA1072R <ENCODER VGFP>
IC301 (C-28) ENCODER
SHP LEVEL
DLD
SHP CLP
TH IN
TH CLP
YL-TH IN
GND
YL-YH CLP
R-Y IN
R-Y DET
R-Y CLP
C-CLP
B-Y IN
B-Y CLP
B-Y DET
HUE CONT
FSC OUT
VCC
4 FSC IN
B LEVEL CONT
SYNC
BF
BLK
N/P PULSE
C-OUT
FADER SIG
EVF OUT
VCC (A)
VIDEO OUT
GND (D)
R-Y SIG
CS AGC
CLP2
CS-Y
LALT
CHR IN
DLE
NOISE SLINE
Y LEVEL
WC
FADER MODE
SET UP
SYNC LEVEL
WC CLP
SET UP CLP
NEGA PED
CIN
EVF SW
Q189 BUFFER (C-24)
Q190 LPF (C-25)
Q191 BLANKING (B-25)
(D-29) Q302 BUFFER
(E-1) Q303 BLK SWITCH
Q305 (B-26) LPF
IC302 MB88341PFV
(F-3) IC302 EVR
W303
N.C
CAM GND
CAM C
CAM Y
(E-28) Q255 TITLE (R-Y) MIX
(D-27) Q257 TITLE (B-Y) MIX
363,364 (F-9) BLANKING
Q365 (G-20) BLANKING PULSE SEP
IC363 (F-22)
① ② ⑬ SWITCH
③ ④ ⑤ SWITCH
⑥ ⑧ ⑨ DIS CHARG
⑩ ⑪ ⑫ SWITCH
IC364 (H-22)
① ② ③ AW COMPALATOR
⑤ ⑥ ⑦ CURRENT SORCE
⑧ ⑨ ⑩ DC OUT BUFFER
⑫ ⑬ ⑭ TRIANGLE WAVEFORMER
(H-21) Q367 CURRENT SORCE
Q310 (F-29) Q314 (F-27)
Q311 (F-2) Q315 (F-2)
Q313 (F-2)
Y FADER

no mark : CAMERA REC mode
＊ : can not be measured

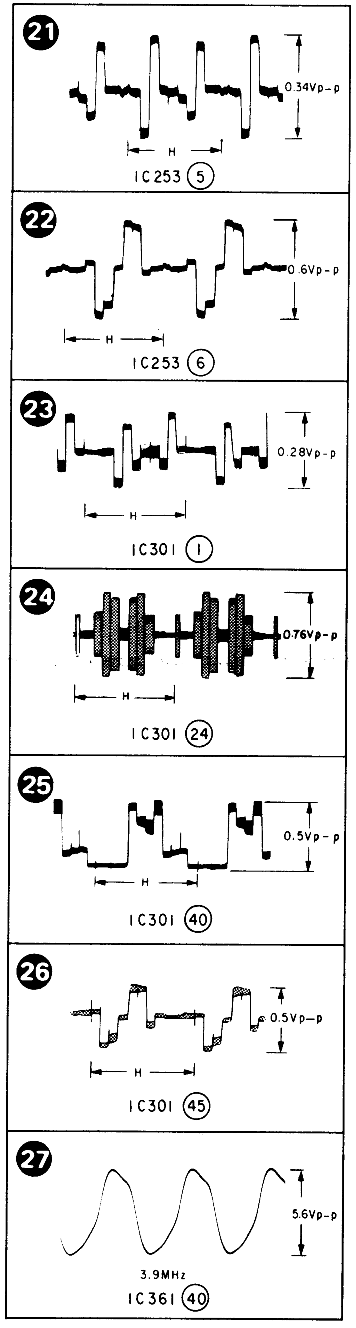
VC-117 BOARD (2
(CP, ED, EVR)


(D-29)
Q302
BUFFER
R304 10K
R316 1800
Q302 2SA1576
C34A 15P
L304 82μH
R314 390
R311 100K
R307 2.2K
W303
1 N.C
2 N.C
3 N.C
4 CAM GND
5 CAM C
6 CAM Y
7 N.C
TO CB-38P BOARD W962
(See Page 119)
D301 MA110
R352 15K
R350 100K
C317 0.01 B
C318 47 6.3V AL
C316 0.1 F
C315 0.1 F
Q312 2SC4081
(F-29)
Q312
BUFFER
R398 3300
C344 39P CH
R353 0
R356 0
R349 4700
C343 2.2 32l6
R368 4.7K
Q315 2SA1576
R394 10K
R392 27K
Q314 XN4601
R391 2200
R351 0
R313 68K
Q310 2SC4081
Q313 XN1401
R388 470K
R395 22K
C344 0.01 B
C342 0.1 F
R386 10K
C389 0.1
R356 22K
Q311 2SC4081
R357 220K
R359 4.7K
Q310(F-29)Q314(F-27)
Q311(F-2) Q315(F-2)
Q313(F-2)
Y FADER
Q305 (B-26)
LPF
C334 1
R338 27K
R339 6800
R337 10K 1/10W
CAM 2

no mark : CAMERA REC mode
✻ : can not be measured

VC-117 BOARD (2/3)
(CP, ED, EVR)

VC-117 BOARD (2/3)

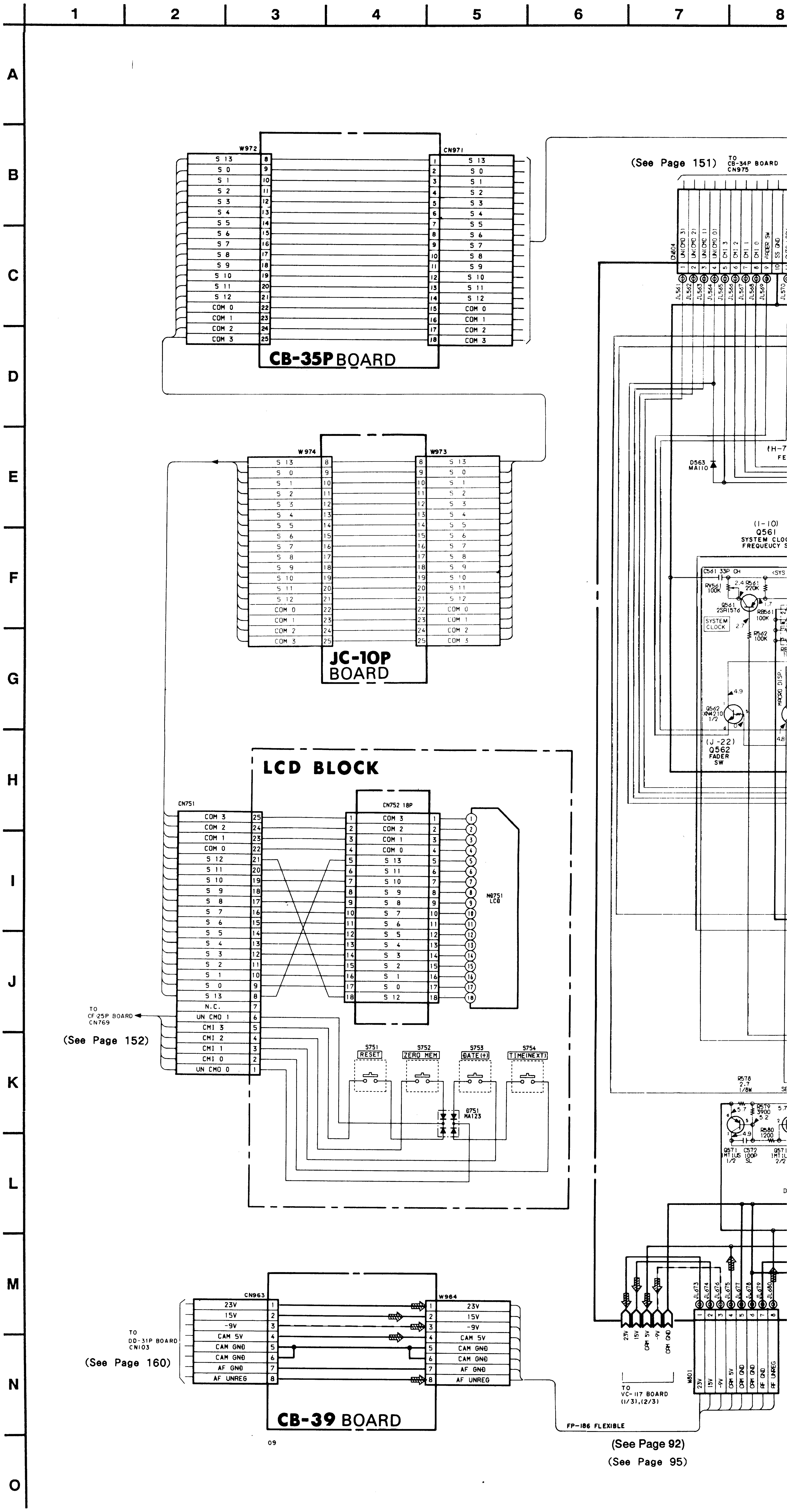


- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	⇒		
PB				

VC-117 (CAMERA), CB-35P (BOARD LINK), CB-39P (BOARD LINK), JC-10P (BOARD LINK), LCD BLOCK SCHEMATIC DIA

— Ref. No. VC-117 BOARD: 10000, CB-35P BOARD: 6000, CB-39P BOARD: 7000, JC-10P BOARD: 1000 series —



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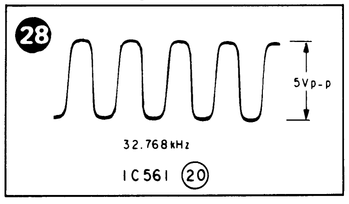
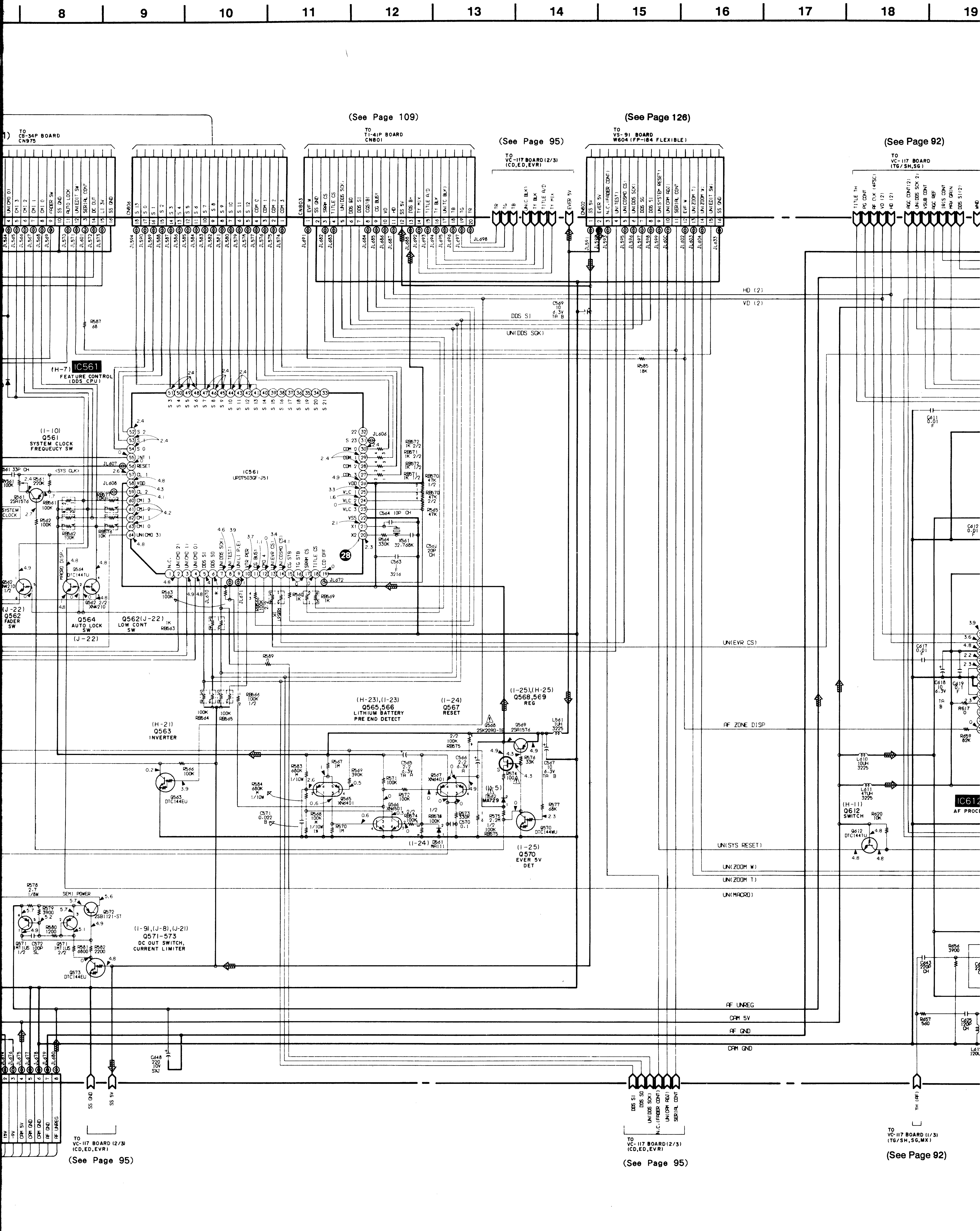
W972
CN971
S 13
S 0
S 1
S 2
S 3
S 4
S 5
S 6
S 7
S 8
S 9
S 10
S 11
S 12
COM 0
COM 1
COM 2
COM 3
CB-35P BOARD
(See Page 151)
TO CB-34P BOARD CN975
W974
W973
JC-10P BOARD
(I-10) Q561 SYSTEM CLOCK FREQUENCY
D563 MA110
C561 33P CH
RV561 100K
R561 220K
Q561 2SA1576
R5561 100K
R562 100K
SYSTEM CLOCK
Q562 XN4210 1/2
(J-22) Q562 FADER SW
MACRO DISP
LCD BLOCK
CN751
CN752 18P
N8751 LCD
N.C.
UN CMD 1
CMI 3
CMI 2
CMI 1
CMI 0
UN CMD 0
TO CF-25P BOARD CN769
(See Page 152)
S751 RESET
S752 ZERO MEM
S753 DATE(+)
S754 TIME(NEXT)
D751 MA123
R578 2.7 1/8W
R579 3900
R580 1200
Q571 IMT1US 1/2
C572 100P SL
Q571 IMT1US 2/2
CN963
W964
23V
15V
-9V
CAM 5V
CAM GND
AF GND
AF UNREG
TO DD-31P BOARD CN103
(See Page 160)
CB-39 BOARD
FP-186 FLEXIBLE
TO VC-117 BOARD (1/3),(2/3)
W801
(See Page 92)
(See Page 95)

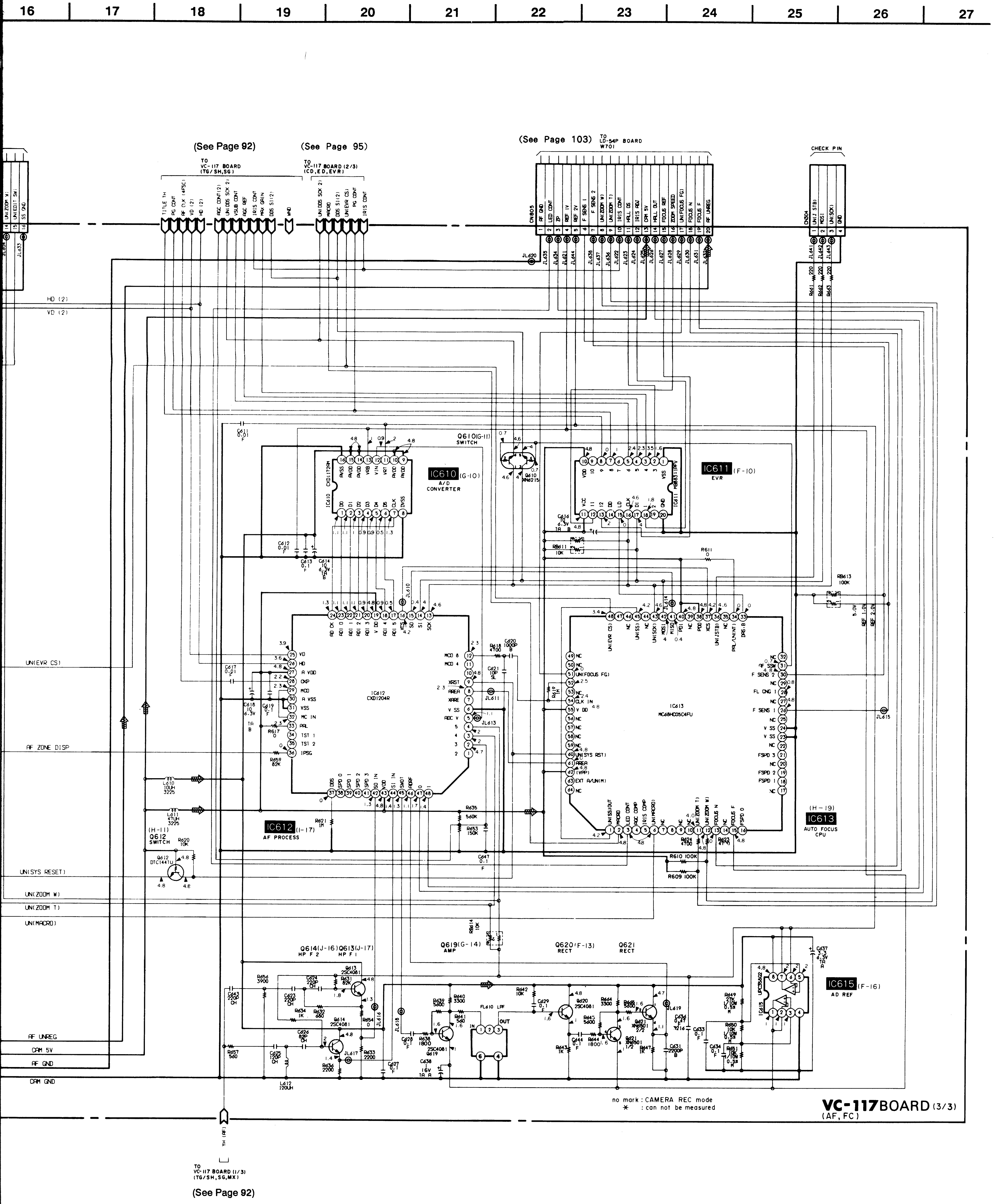
VC-117 BOARD (3/3)



- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	⇛		
PB				


8
9
10
11
12
13
14
15
16
17
18
19
TO CB-34P BOARD CN975
(See Page 109)
TO T1-41P BOARD CN801
(See Page 95)
TO VC-117 BOARD (2/3) (CD,ED,EVR)
(See Page 126)
TO VS-91 BOARD W604 (FP-184 FLEXIBLE)
(See Page 92)
TO VC-117 BOARD (TG/SH,SG)
CN803
CN602
HD (2)
VD (2)
DDS SI
UN(DDS SCK)
(H-7) IC561
FEATURE CONTROL (DDS CPU)
IC561
UPD7503GF-J51
(I-10) Q561
SYSTEM CLOCK FREQUEUCY SW
SYSTEM CLOCK
(J-22) Q562
FADER SW
Q564
AUTO LOCK SW
(J-22)
Q562(J-22)
LOW CONT SW
(H-21) Q563
INVERTER
(H-23),(I-23) Q565,566
LITHIUM BATTERY PRE END DETECT
(I-24) Q567
RESET
(I-25),(H-25) Q568,569
REG
(I-25) Q570
EVER 5V DET
(I-9),(J-8),(J-21) Q571-573
DC OUT SWITCH, CURRENT LIMITER
SEMI POWER
UN(EVR CS)
AF ZONE DISP
UN(SYS RESET)
UN(ZOOM W)
UN(ZOOM T)
UN(MACRO)
AF UNREG
CAM 5V
AF GND
CAM GND
(H-11) Q612
SWITCH
IC612
AF PROC
SS GND
SS 5V
TO VC-117 BOARD (2/3) (CD,ED,EVR)
(See Page 95)
DDS SI
DDS SO
UN(DDS SCK)
N.C.(FADER CONT)
UN(CAM RQ1)
SERIAL CONT
TO VC-117 BOARD (2/3) (CD,ED,EVR)
(See Page 95)
YH (AF)
TO VC-117 BOARD (1/3) (TG/SH,SG,MX)
(See Page 92)
28

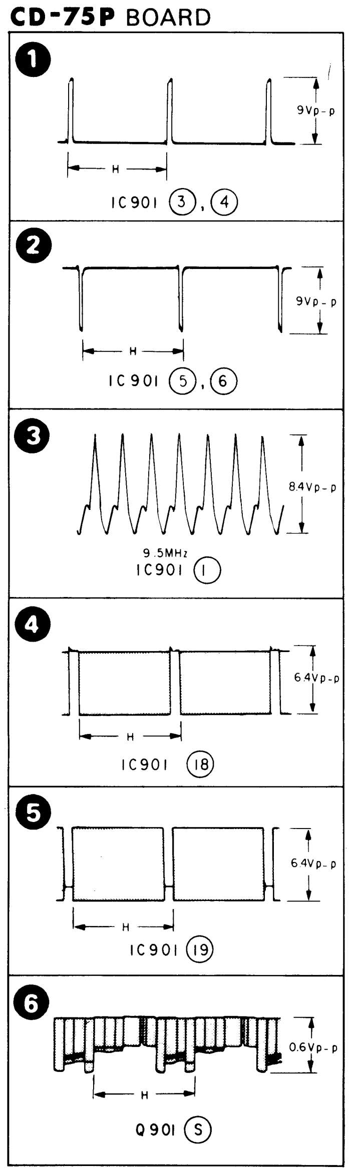

16
17
18
19
20
21
22
23
24
25
26
27
(See Page 92)
TO VC-117 BOARD (TG/SH,SG)
(See Page 95)
TO VC-117 BOARD (2/3) (CD,ED,EVR)
(See Page 103)
TO LD-54P BOARD W701
CHECK PIN
CN805
CN504
TITLE TH
PG CONT
RF CLK (4FSC)
VD (2)
HD (2)
AGC CONT (2)
UN (DDS SCK 2)
VSUB CONT
AGC REF
IRIS CONT
MAG GAIN
DDS S1 (2)
WND
MACRO
DDS S1 (2)
UN (EVR CS)
AF GND
LED CONT
ZP
REF 1V
REF 2V
F SENS 1
F SENS 2
UN (ZOOM W)
UN (ZOOM T)
IRIS COMP
HALL DS
IRIS ADJ
CAM 5V
HALL OUT
FOCUS REF
ZOOM SPEED
UN (FOCUS FG)
FOCUS N
FOCUS F
AF UNREG
UN (J STB)
MOSI
UN (SCK)
GND
HD (2)
VD (2)
UN (EVR CS)
AF ZONE DISP
UN (SYS RESET)
UN (ZOOM W)
UN (ZOOM T)
UN (MACRO)
AF UNREG
CAM 5V
AF GND
CAM GND
IC610 (G-10)
A/D CONVERTER
CXD1172AM
Q610 (G-11)
SWITCH
XN6215
IC611 (F-10)
EVR
MB88311PFV
IC612 (I-17)
AF PROCESS
CXD1204R
IC613
(H-19)
AUTO FOCUS CPU
MC68HC05C4FU
Q612 (H-11)
SWITCH
DTC144TU
Q614 (J-16) HP F 2
Q613 (J-17) HP F 1
2SC4081
Q619 (G-14) AMP
Q620 (F-13) RECT
Q621 RECT
XN4501
FL610 LPF
IN
OUT
IC615 (F-16)
AD REF
UPC358G2
L610 10UH
L611 47UH
L612 120UH
R610 100K
R609 100K
R611 0
RB611 10K
RB613 100K
R661 220
R662 220
R663 220
5.0V
REF 1.0V
REF 2.0V
YH (AF)
TO VC-117 BOARD (1/3) (TG/SH,SG,MX)
(See Page 92)

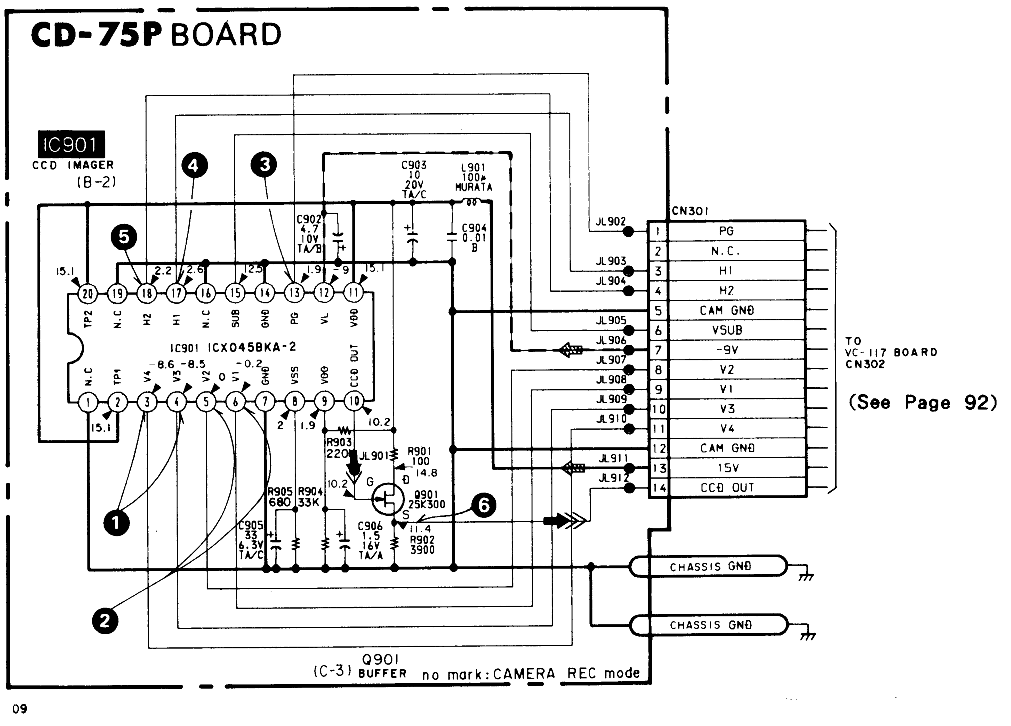
no mark : CAMERA REC mode
∗ : can not be measured

VC-117BOARD (3/3)
(AF, FC)

CD-75P (CCD IMAGER) SCHEMATIC DIAGRAM

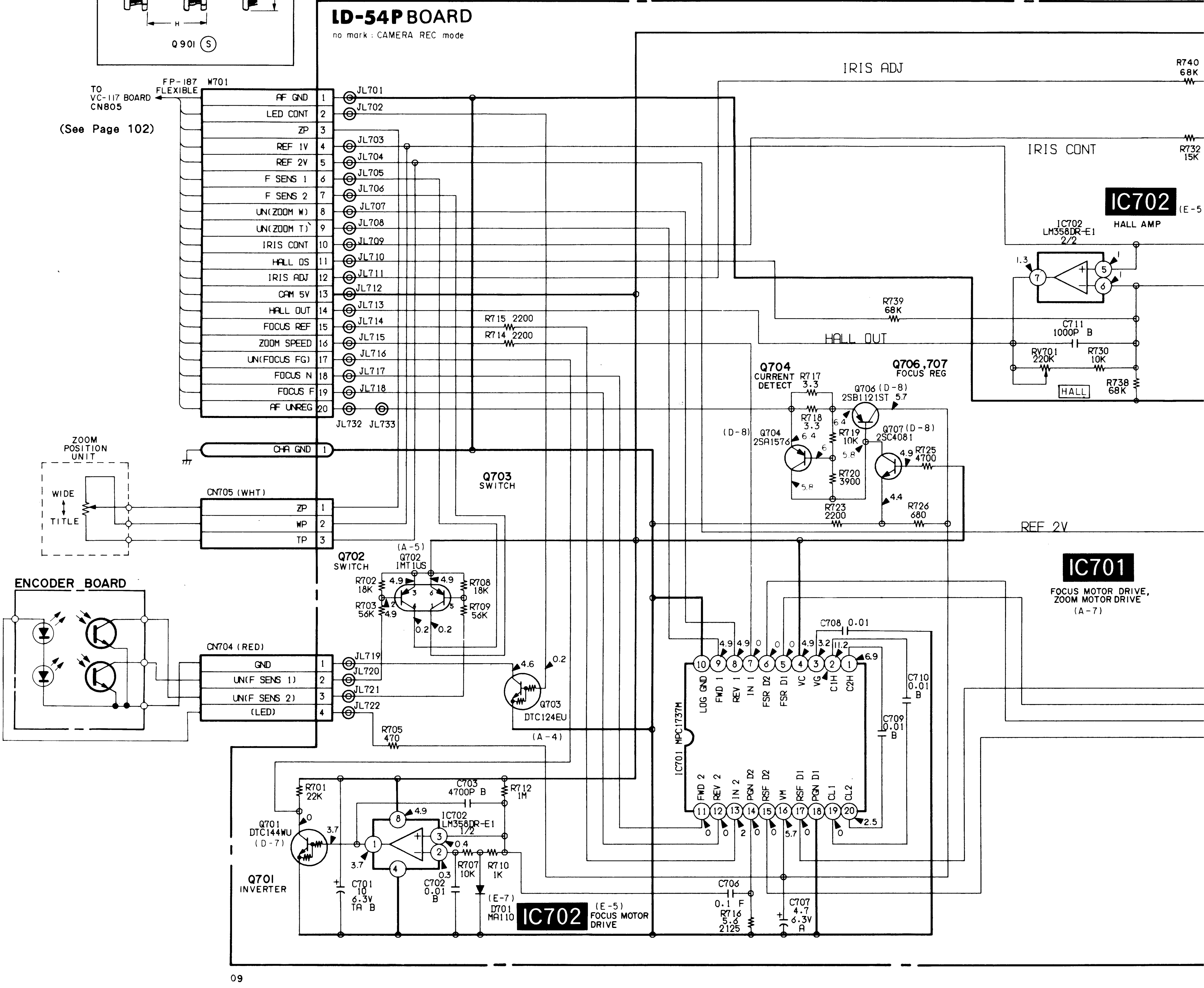
— Ref. No. CD-75P BOARD: 4000 series —




CD-75P BOARD
IC901
CCD IMAGER
(B-2)
IC901 ICX045BKA-2
C903 10 20V TA/C
L901 100μ MURATA
C902 4.7 10V TA/B
C904 0.01 B
R903 220
R905 680
R904 33K
C905 33 6.3V TA/C
C906 1.5 16V TA/A
R901 100
R902 3900
Q901 2SK300
JL902
JL903
JL904
JL905
JL906
JL907
JL908
JL909
JL910
JL911
JL912
CN301
1 PG
2 N.C.
3 H1
4 H2
5 CAM GND
6 VSUB
7 -9V
8 V2
9 V1
10 V3
11 V4
12 CAM GND
13 15V
14 CCD OUT
TO VC-117 BOARD CN302
(See Page 92)
CHASSIS GND
CHASSIS GND
Q901
(C-3) BUFFER
no mark : CAMERA REC mode
09

LD-54P (IRIS/FOCUS/ZOOM MOTOR DRIVE) SCHEMATIC DIAGRAM

— Ref. No. LD-54P BOARD: 3000 series —


LD-54P BOARD
no mark : CAMERA REC mode
TO VC-117 BOARD CN805
(See Page 102)
FP-187 FLEXIBLE
W701
1 AF GND
2 LED CONT
3 ZP
4 REF 1V
5 REF 2V
6 F SENS 1
7 F SENS 2
8 UN(ZOOM W)
9 UN(ZOOM T)
10 IRIS CONT
11 HALL OS
12 IRIS ADJ
13 CAM 5V
14 HALL OUT
15 FOCUS REF
16 ZOOM SPEED
17 UN(FOCUS FG)
18 FOCUS N
19 FOCUS F
20 AF UNREG
JL701 … JL722
JL732 JL733
CHA GND
ZOOM POSITION UNIT
WIDE
TITLE
CN705 (WHT)
ZP
WP
TP
ENCODER BOARD
CN704 (RED)
GND
UN(F SENS 1)
UN(F SENS 2)
(LED)
IRIS ADJ
IRIS CONT
HALL OUT
REF 2V
R740 68K
R732 15K
R739 68K
R715 2200
R714 2200
IC702
(E-5)
HALL AMP
IC702 LM358DR-E1 2/2
C711 1000P B
RV701 220K
R730 10K
R738 68K
HALL
Q704
CURRENT DETECT
Q706,707
FOCUS REG
Q704 2SA1576
Q706 (D-8) 2SB1121ST
Q707 (D-8) 2SC4081
R717 3.3
R718 3.3
R719 10K
R720 3900
R723 2200
R725 4700
R726 680
Q703
SWITCH
Q702
SWITCH
(A-5) Q702 IMT1US
R702 18K
R703 56K
R708 18K
R709 56K
Q703 DTC124EU
(A-4)
R705 470
IC701
FOCUS MOTOR DRIVE, ZOOM MOTOR DRIVE
(A-7)
IC701 MPC1737M
LOG GND
FWD 1
REV 1
IN 1
FSR D2
FSR D1
VC
VG
C1H
C2H
FWD 2
REV 2
IN 2
PGN D2
RSF D2
VM
RSF D1
PGN D1
CL1
CL2
C708 0.01
C710 0.01 B
C709 0.01 B
C706 0.1 F
R716 5.6 2125
C707 4.7 6.3V A
R701 22K
Q701 DTC144WU
(D-7)
Q701
INVERTER
C703 4700P B
R712 1M
IC702 LM358DR-E1 1/2
C701 10 6.3V TA B
C702 0.01 B
R707 10K
R710 1K
(E-7) D701 MA110
IC702
(E-5) FOCUS MOTOR DRIVE
09

CAUTIONS FOR REPL

- According to type of C board), it is necessary (IC001 on the DT-77LB b The repairing CCD image ROM.

  So when replacing the C sating ROM is installed before replacement.
- Since the mounted CD-7 supplied asa repair parts respectively, replace the board to the new when re
- When you replaced the camera head adjustment.
- CCD imager has such a static electricityy, so hand Further, be sure that the dust and no entry of brigh

- **SIGNAL PATH**

	VIDEO	
	CHROMA	Y
REC		
PB		

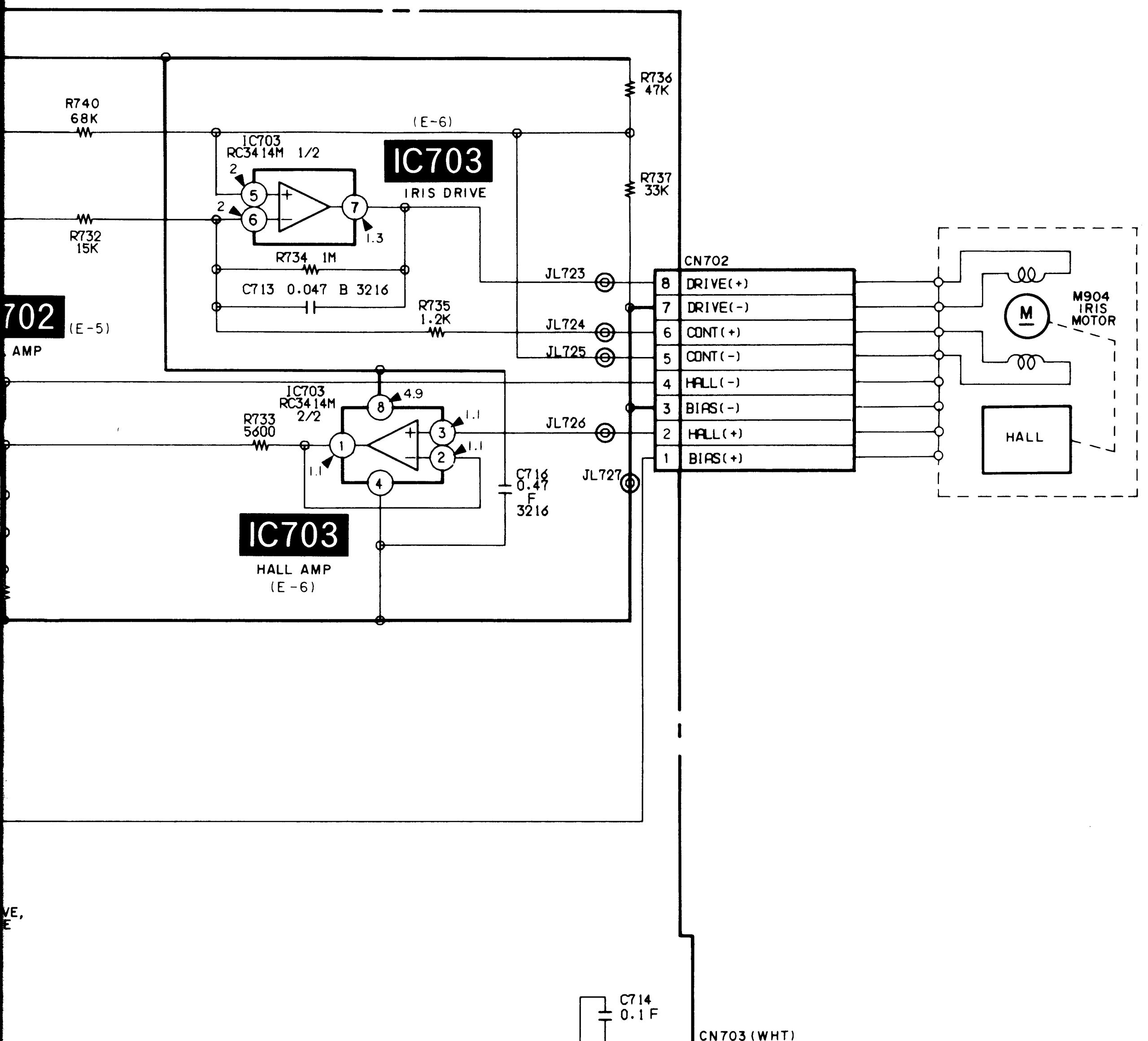
OR REPLACING THE CCD IMAGER

type of CCD imager (IC901 on the CD-75P
necessary to require the compensating ROM
DT-77LB board).
CCD imager does not require the compensating

acing the CCD imager on which the compen-
is installed, remove the compensating ROM
ment.
unted CD-75P and DT-77LB boards ehich are
repair parts are not installed IC901 and IC001
replace the respective ICs from the previous
ew when replacing each board.
placed the CCD imager, perform the overall
djustment.
has such a structure that it may be spoiled by
tyy, so handle it with a care similar for MOS IC.
re that the light receiving part has no stick of
ntry of bright light.

I

VIDEO SIGNAL			AUDIO SIGNAL
A	Y	Y/CHROMA	
		➡	



R740
68K
R732
15K
702
(E-5)
AMP
(E-6)
IC703
RC3414M 1/2
IC703
IRIS DRIVE
R734 1M
C713 0.047 B 3216
R735
1.2K
R736
47K
R737
33K
IC703
RC3414M 2/2
R733
5600
4.9
1.1
C716
0.47
F
3216
IC703
HALL AMP
(E-6)
JL723
JL724
JL725
JL726
JL727
CN702
8 DRIVE(+)
7 DRIVE(-)
6 CONT(+)
5 CONT(-)
4 HALL(-)
3 BIAS(-)
2 HALL(+)
1 BIAS(+)
M904
IRIS
MOTOR
HALL
VE,
E
C714
0.1 F
JL728
JL729
JL730
JL731
C715
0.1
F
CN703 (WHT)
1 ZOOM TD
2 ZOOM WD
3 FOCUS ND
4 FOCUS FD
M905
ZOOM
MOTOR
M906
FOCUS
MOTOR

A-7071-537-A CD-75P BOARD, COMPLETE
****

(TRANSISTOR)

Q901	8-765-420-02	TRANSISTOR	2SK300-3

A-7062-994-A LD-54P BOARD, COMPLETE
****

(DIODE)

D701	8-719-404-46	DIODE	MA110-TX

(IC)

IC701	8-759-037-20	IC	MPC1737M
IC702	8-759-100-94	IC	uPC358G2
IC703	8-759-981-82	IC	RC3414M

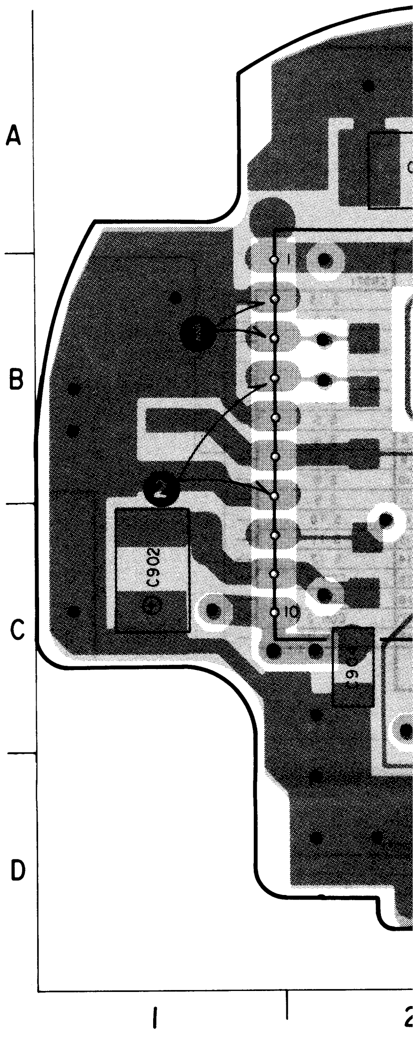
(TRANSISTOR)

Q701	8-729-905-15	TRANSISTOR	DTC144WU
Q702	8-729-920-39	TRANSISTOR	IMT-1US
Q703	8-729-905-61	TRANSISTOR	DTC124EU
Q704	8-729-905-23	TRANSISTOR	2SA1576-R
Q706	8-729-106-60	TRANSISTOR	2SB1115A
Q707	8-729-117-32	TRANSISTOR	2SC4177

CD-75P (CCD IMAGER) PRINTED WIRING BOARD

— Ref. No. CD-75P BOARD: 4000 series —

CD-75P BOARD (CONDUCTO

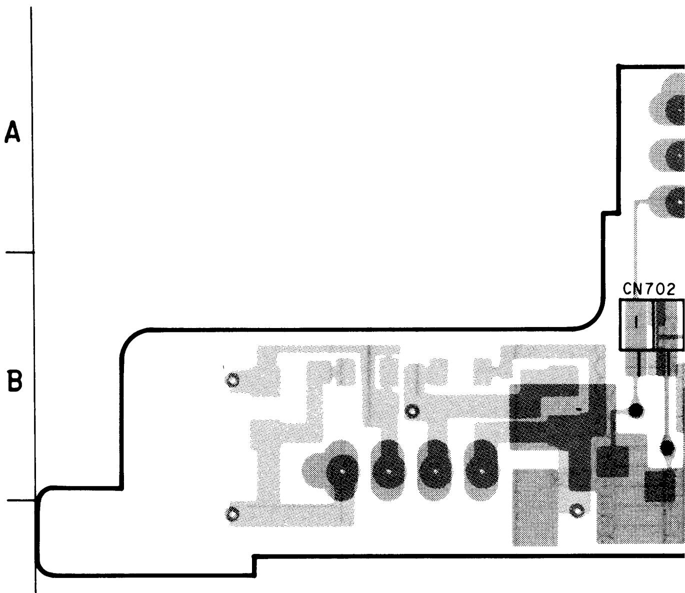


A
B
C
D
C902
1
2
10
1

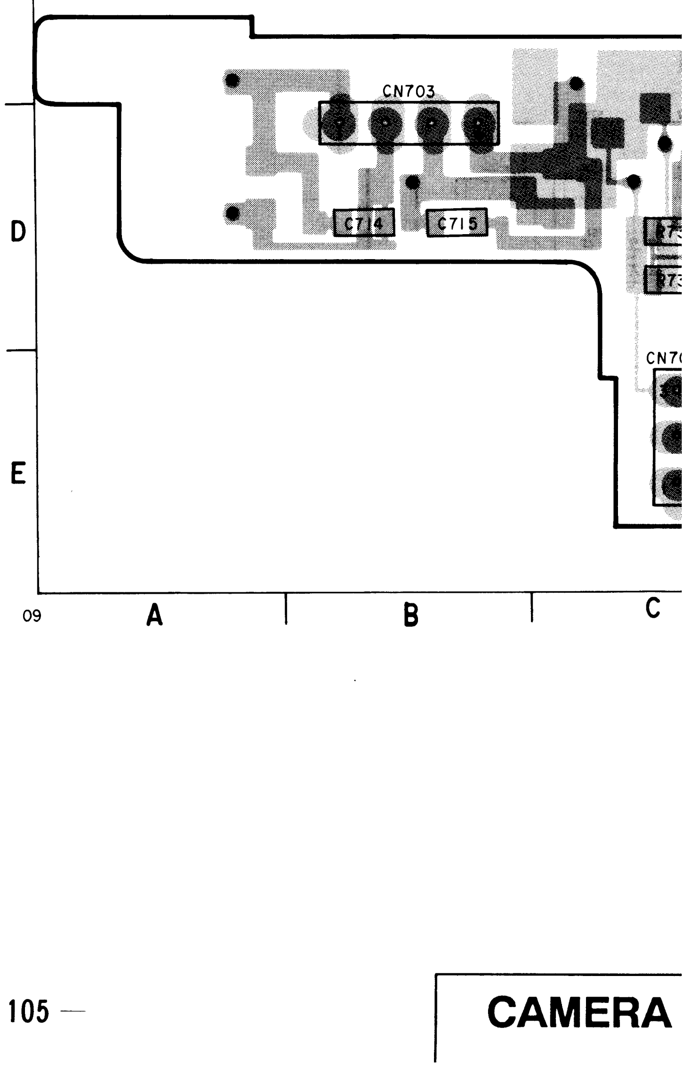
LD-54P (IRIS/FOCUS/ZOOM MOTOR DRIVE) PRINT

— Ref. No. LD-54P BOARD: 3000 series —

LD-54P BOARD (COMPONENT SIDE)



C **LD-54P** BOARD (CONDUCTOR SIDE)



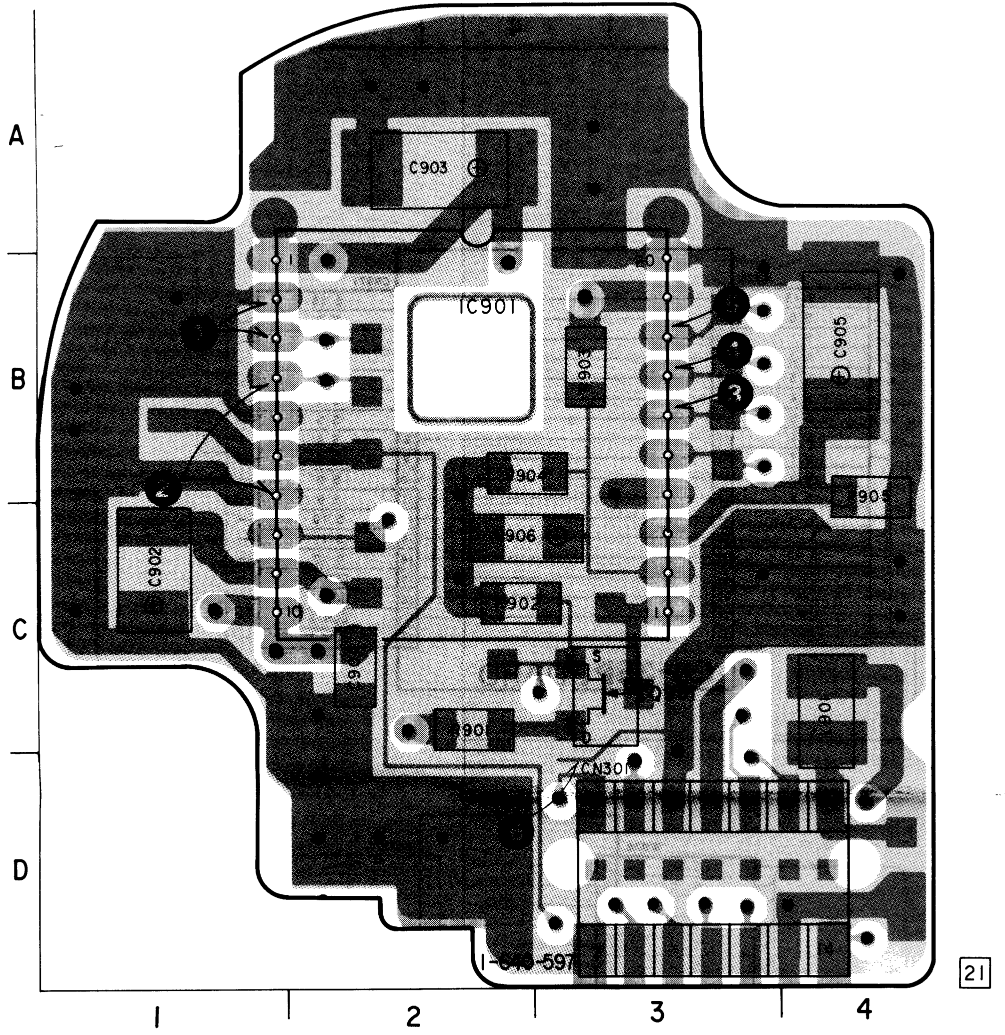
D
E
CN703
C714
C715
CN70
09
A
B
C

CD-75P (CCD IMAGER) PRINTED WIRING BOARD

— Ref. No. CD-75P BOARD: 4000 series —

- **For printed wiring boards.**
- CD-75P board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.

CD-75P BOARD (CONDUCTOR SIDE)

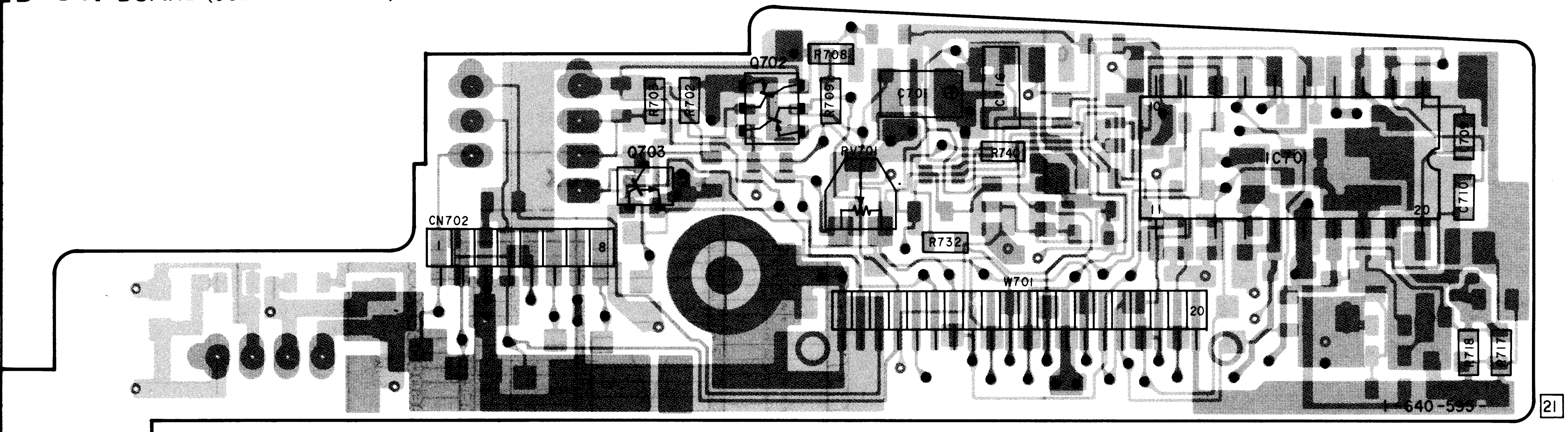

A
B
C
D
1
2
3
4
C903
IC901
C905
C902
904
906
902
903
905
CN301
1-640-597
21

LD-54P (IRIS/FOCUS/ZOOM MOTOR DRIVE) PRINTED WIRING BOARD

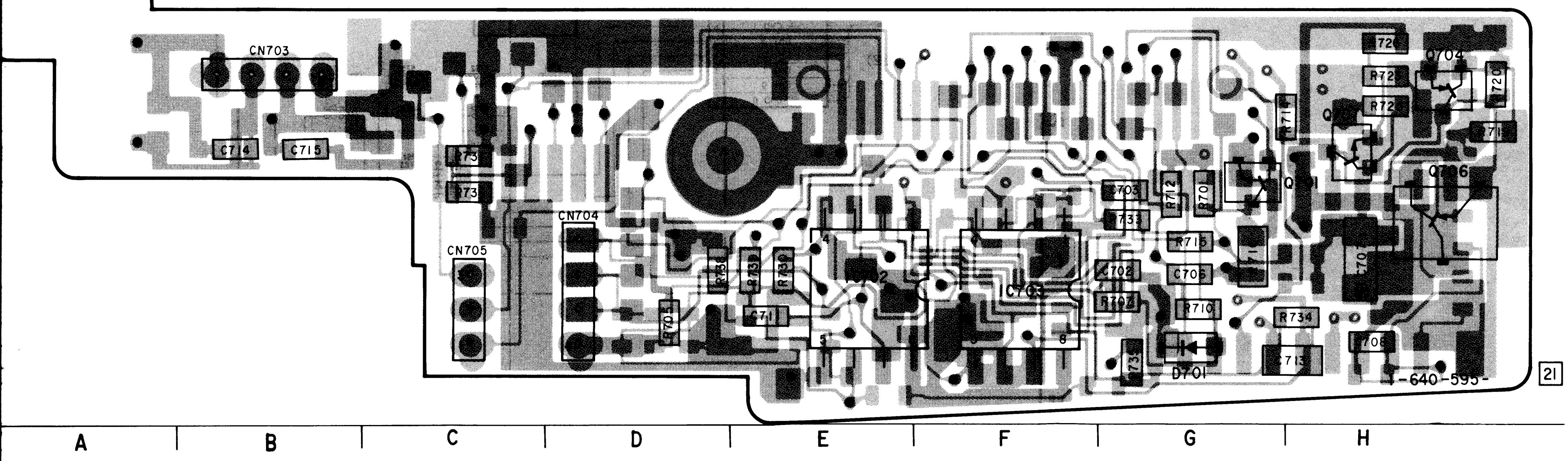
— Ref. No. LD-54P BOARD: 3000 series —

- **For printed wiring boards.**
- LD-54P board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.

LD-54P BOARD (COMPONENT SIDE)


Q702
R706
R705
R704
R703
C701
C716
Q703
RV701
R740
IC701
10
11
20
C710
CN702
1
8
R732
W701
20
R718
R717
1-640-595
21

LD-54P BOARD (CONDUCTOR SIDE)

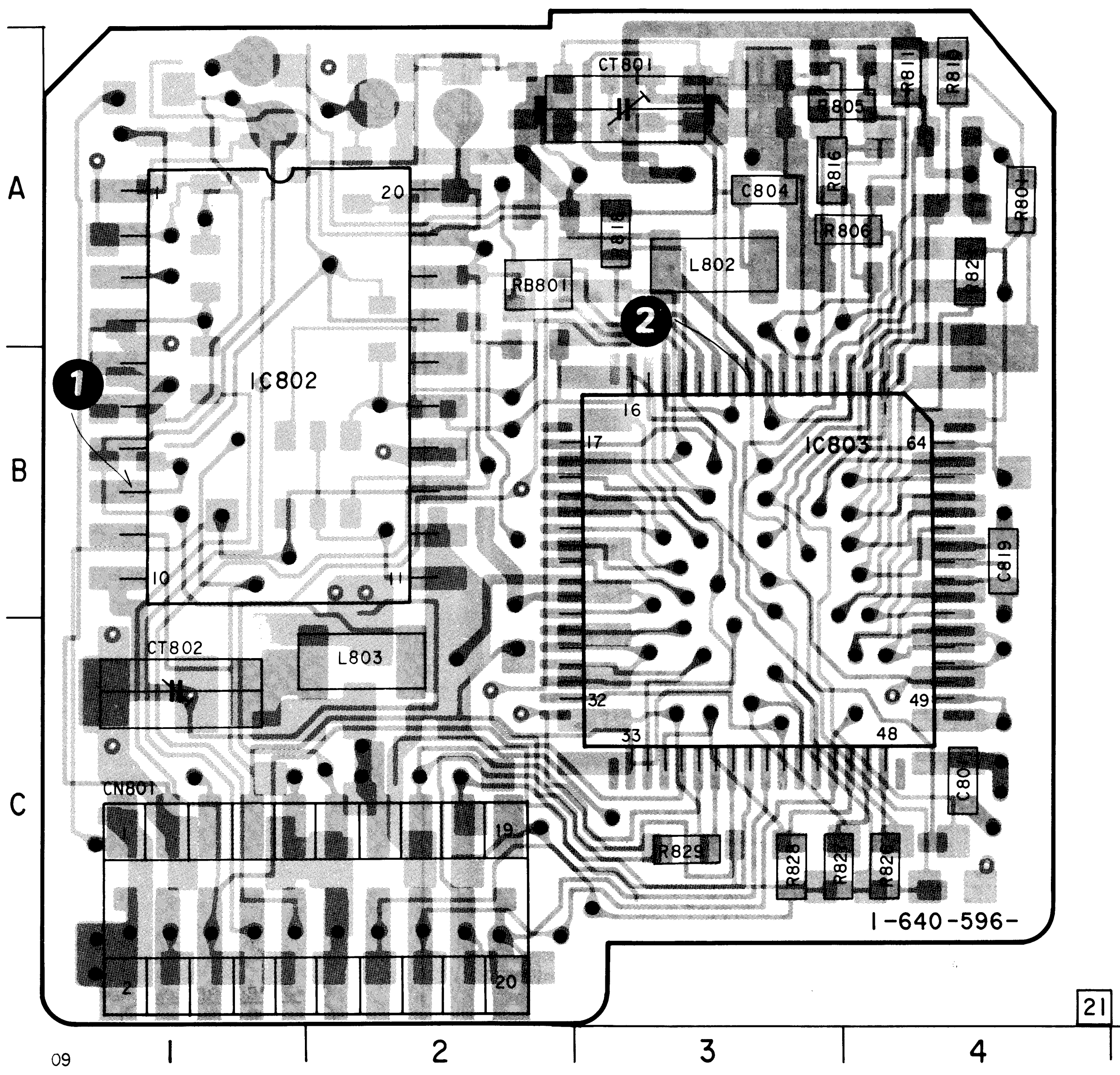

CN703
C714
C715
CN705
CN704
R736
R738
R739
C711
IC702
IC703
R703
R733
R712
R707
R715
C706
C702
R710
R734
C713
D701
R714
Q701
Q704
Q706
R720
R708
1-640-595
21
A
B
C
D
E
F
G
H

TI-41P (DIGITAL TITLER) PRINTED WIRING BOARD
— Ref. No. TI-41P BOARD: 4000 series —

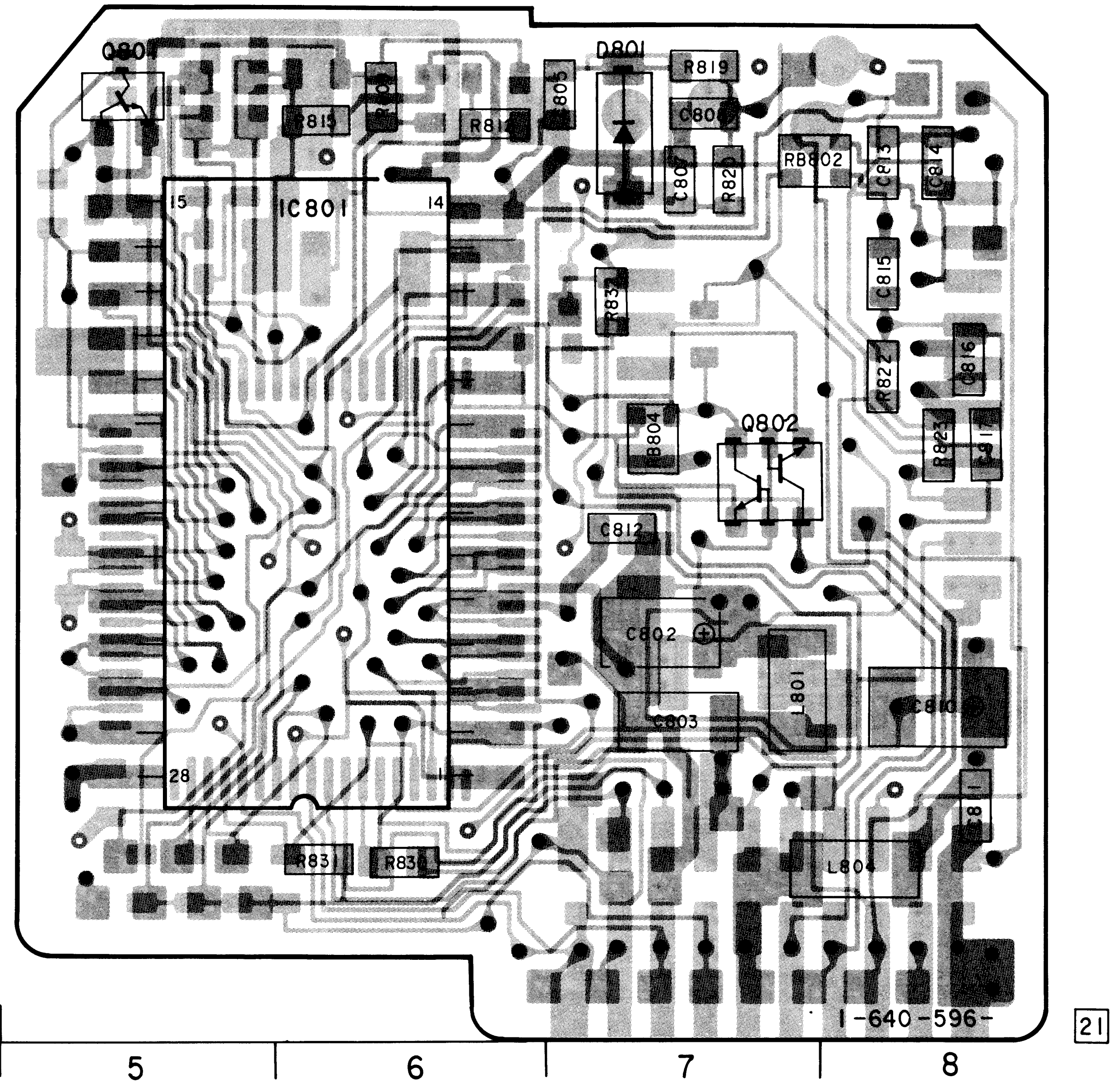
- **For printed wiring boards.**
- TI-41P board is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.

TI-41P (DIGIT
— Ref. No. TI-41P

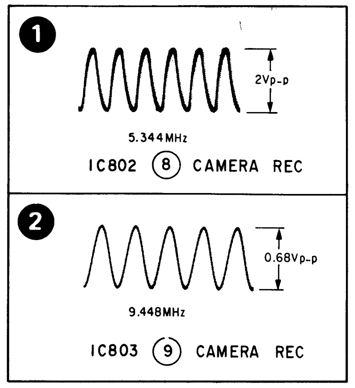
TI-41PBOARD (COMPONENT SIDE)

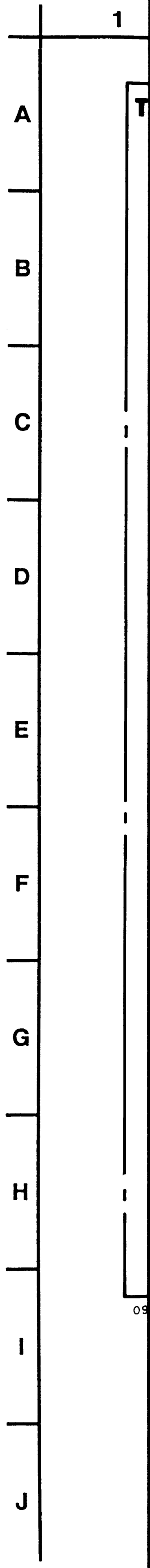

A
B
C
CT801
R805
R811
R816
C804
R806
RB801
L802
IC802
20
10
11
16
17
IC803
64
32
33
48
49
C819
CT802
L803
CN801
19
20
2
R829
I-640-596-
21
09
1
2
3
4

TI-41PBOARD (CONDUCTOR SIDE)


Q801
R815
D801
R819
C806
RB802
15
14
IC801
C815
Q802
C812
C802
C803
L801
28
R831
R830
L804
I-640-596-
21
5
6
7
8

TI-41PBOARD



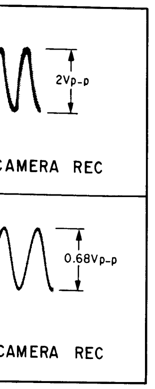

1
A
B
C
D
E
F
G
H
I
J

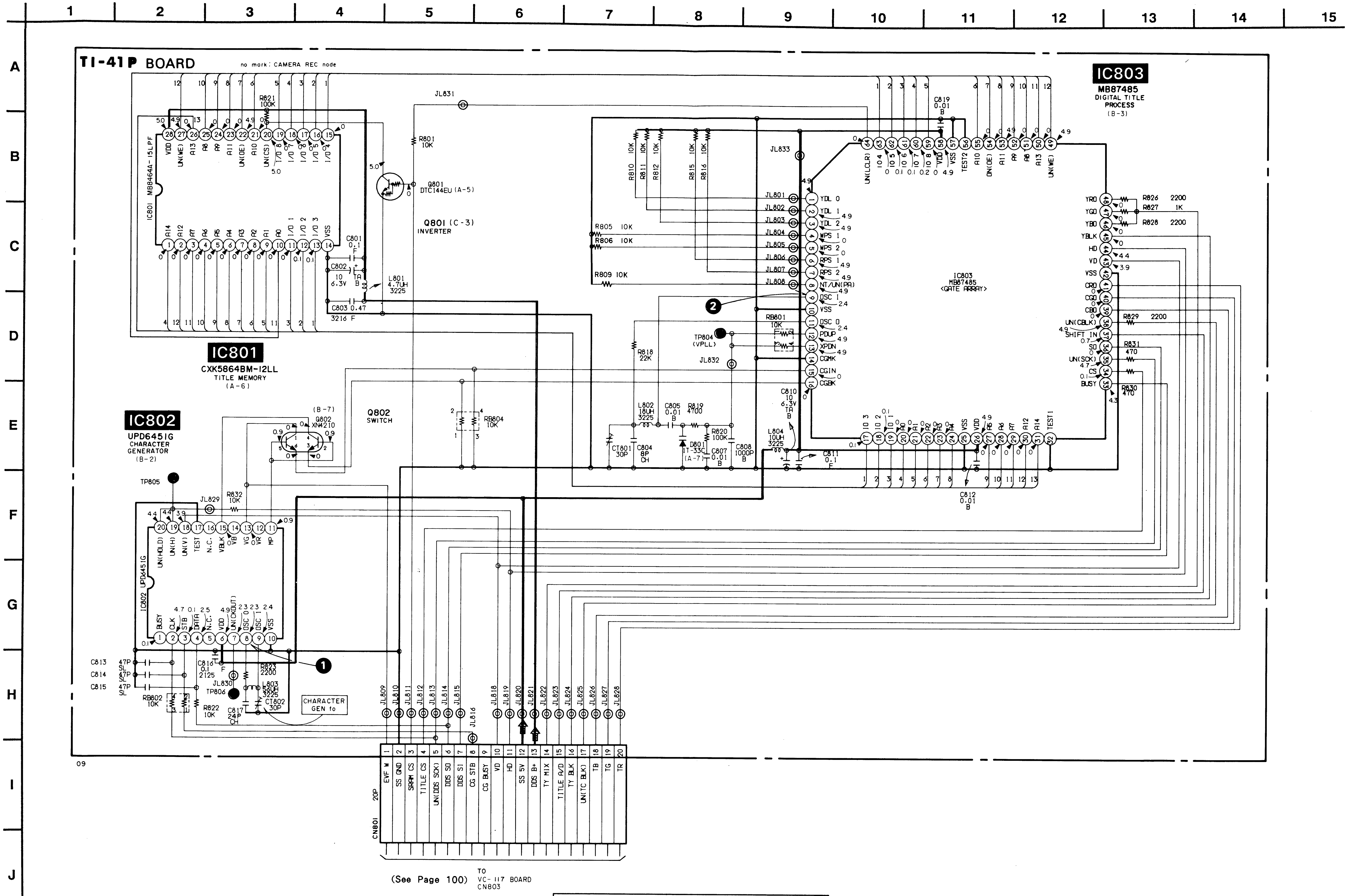
A-7062-995-A TI-41P BOARD, COMPLETE
****

		(DIODE)	
D801	8-713-300-88	DIODE	1T33C-01
		(IC)	
IC801	8-759-507-53	IC	MS6264CLL-15FC
IC802	8-759-150-75	IC	uPD6145G-621
IC803	8-759-983-54	IC	MB87485
		(TRANSISTOR)	
Q801	8-729-905-18	TRANSISTOR	DTC144EU
Q802	8-729-403-24	TRANSISTOR	XN4210

TI-41P (DIGITAL TITLER) SCHEMATIC DIAGRAM

— Ref. No. TI-41P BOARD: 4000 series —


2Vp-p
AMERA REC
0.68Vp-p
AMERA REC

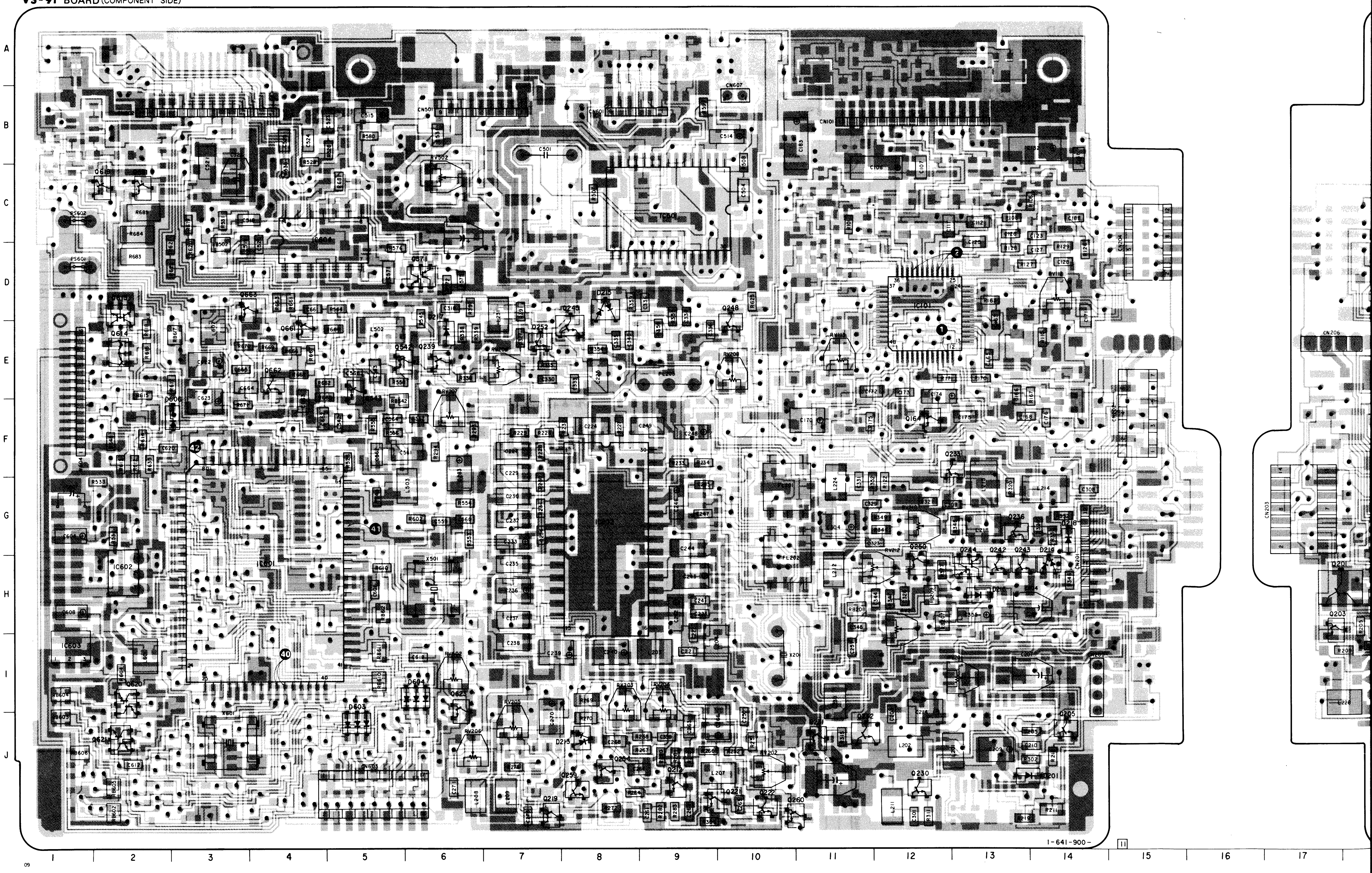

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
TI-41P BOARD
no mark : CAMERA REC mode
IC801
CXK5864BM-12LL
TITLE MEMORY
(A-6)
IC801 MB8464A-15LPF
R821 100K
JL831
R801 10K
Q801 DTC144EU (A-5)
Q801 (C-3)
INVERTER
C801 0.1 F
C802 10 6.3V TA B
L801 4.7UH 3225
C803 0.47 3216 F
IC802
UPD6451G
CHARACTER GENERATOR
(B-2)
Q802 XN4210
(B-7)
Q802 SWITCH
RB804 10K
TP805
JL829
R832 10K
C813 47P SL
C814 47P SL
C815 47P SL
RB802 10K
R822 10K
C816 0.1 2125 F
JL830
TP806
R823 2200
L803 330UH 3225
CT802 30P
C817 24P CH
CHARACTER GEN fo
IC803
MB87485
DIGITAL TITLE PROCESS
(B-3)
IC803 MB87485 <GATE ARRAY>
C819 0.01 B
JL833
R810 10K
R811 10K
R812 10K
R815 10K
R816 10K
R805 10K
R806 10K
R809 10K
JL801
JL802
JL803
JL804
JL805
JL806
JL807
JL808
YDL 0
YDL 1
YDL 2
NPS 1
NPS 2
RPS 1
RPS 2
NT/UN(PA)
OSC I
VSS
OSC O
PDUP
XPDN
CGMK
CGIN
CGBK
RB801 10K
TP804 (VPLL)
JL832
R818 22K
L802 18UH 3225
C805 0.01 B
R819 4700
R820 100K
D801 1T-33C (A-7)
C807 0.01 B
C808 1000P B
CT801 30P
C804 8P CH
C810 10 6.3V TA B
L804 10UH 3225
C811 0.1
C812 0.01 B
YRO
YGO
YBO
YBLK
HD
VD
VSS
CRO
CGO
CBO
UN(CBLK)
SHIFT IN
SO
UN(SCK)
CS
BUSY
TEST1
R826 2200
R827 1K
R828 2200
R829 2200
R831 470
R830 470
JL809
JL810
JL811
JL812
JL813
JL814
JL815
JL816
JL818
JL819
JL820
JL821
JL822
JL823
JL824
JL825
JL826
JL827
JL828
1 EVF W
2 SS GND
3 SRAM CS
4 TITLE CS
5 UN(DDS SCK)
6 DDS SO
7 DDS SI
8 CG STB
9 CG BUSY
10 VD
11 HD
12 SS 5V
13 DDS B+
14 TY MIX
15 TITLE A/D
16 TY BLK
17 UN(TC BLK)
18 TB
19 TG
20 TR
CN801 20P
TO VC-117 BOARD CN803
(See Page 100)
09

VS-91 (HEAD AMP/VIDEO/SERVO/SYSTEM CONTROL), CB-38P (BOARD LINK), PIN JACK ASSEMBLY (TERMINAL) PRINTED WIRING BOARDS

– Ref. No. VS-91, CB-38P BOARDS: 2000 series –

- **For printed wiring boards.**
- VS-91, CB-38P boards are the printed wiring board which has four layers structure but inner two layers' patterns are omitted.
- PIN JACK Assembly is replaced as blocks, so that there PRINTED WIRING BOARDS are omitted.

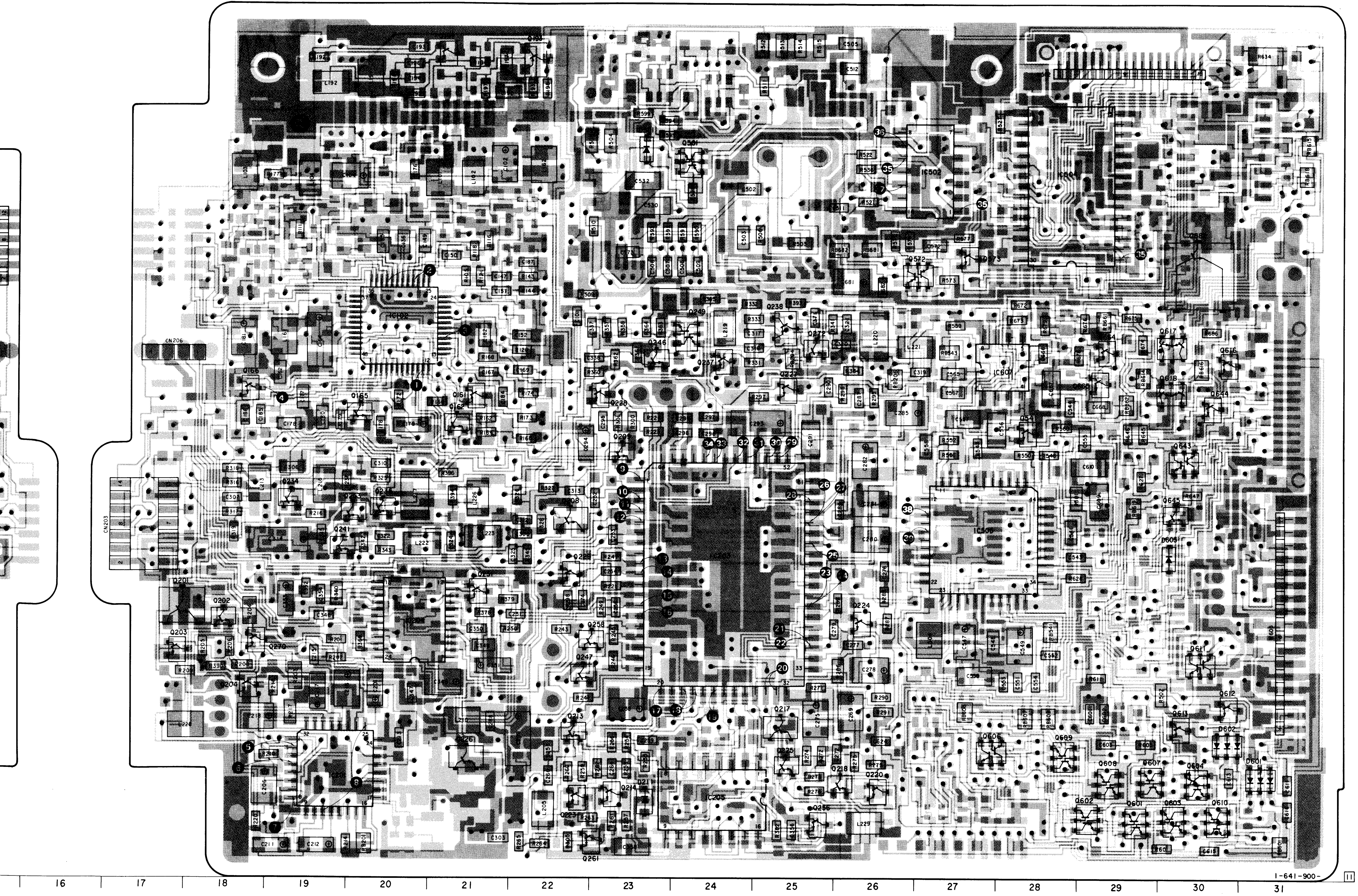
VS-91 BOARD (COMPONENT SIDE)


A
B
C
D
E
F
G
H
I
J
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
CN501
CN607
CN101
C501
IC501
IC601
IC602
IC603
IC604
IC101
CN204
CN206
CN203
CN201
X501
X601
CN503
1-641-900-
11
09

VIDEO **VIDEO**

has
d.
here

VS-91 BOARD (CONDUCTOR SIDE)


CN206
CN203
IC101
IC502
IC503
IC505
IC607
IC201
IC203
IC205
1-641-900-
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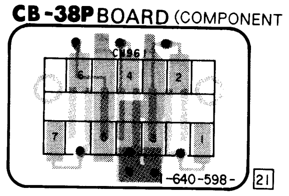
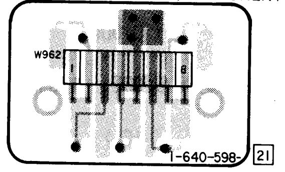
31

CB-38P BOARD (COMPONENT SIDE)



CB-38P BOARD (COMPONENT SIDE)


W962
1-640-598-
21

A-7062-990-A VS-91 BOARD, COMPLETE
****

(DIODE)

D201	8-719-988-62	DIODE	1SS355
D211	8-719-118-21	DIODE	1SS283
D213	8-719-404-35	DIODE	MA141WK
D214	8-719-404-35	DIODE	MA141WK
D215	8-719-800-76	DIODE	1SS226
D216	8-719-988-62	DIODE	1SS355
D217	8-719-988-62	DIODE	1SS355
D218	8-719-988-62	DIODE	1SS355
D501	8-719-404-46	DIODE	MA110-TX
D601	8-719-404-40	DIODE	MA121
D602	8-719-404-40	DIODE	MA121
D603	8-719-404-40	DIODE	MA121
D604	8-719-404-40	DIODE	MA121
D605	8-719-988-62	DIODE	1SS355
D606	8-719-988-62	DIODE	1SS355

(IC)

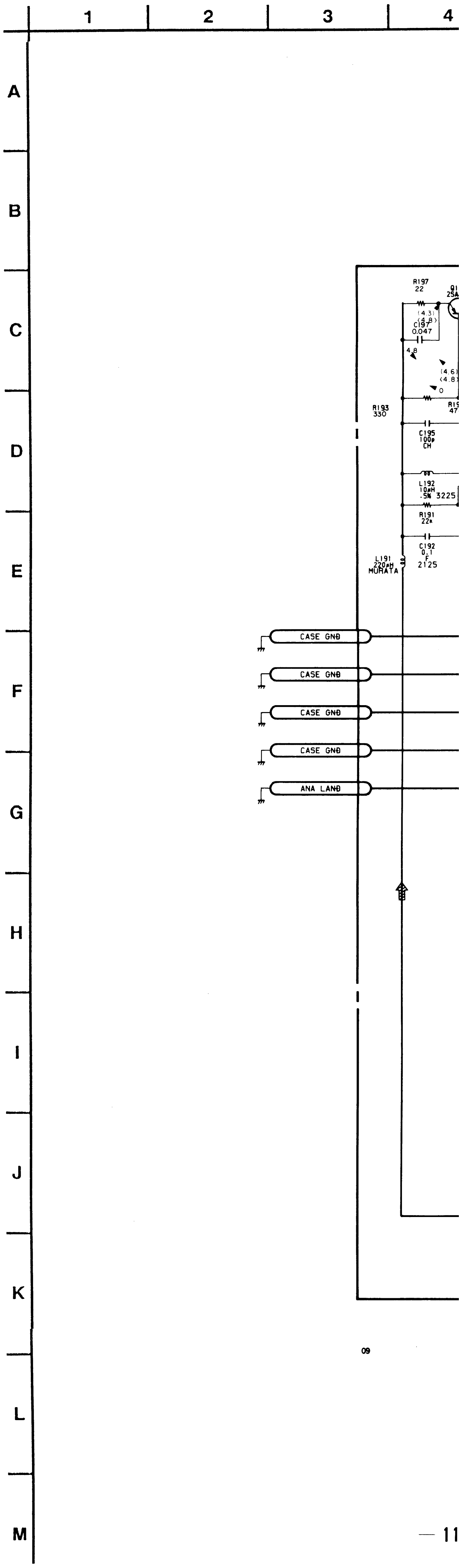
IC101	8-752-033-38	IC	CXA1202R
IC102	8-752-033-38	IC	CXA1202R
IC201	8-752-033-40	IC	CXA1201Q
IC202	8-752-324-87	IC	CXL1502M
IC203	8-752-034-40	IC	CXA1200BQ
IC204	8-759-605-61	IC	CXA1203N
IC205	8-759-009-22	IC	MC14094BF
IC501	8-759-990-55	IC	CXA8006M
IC502	8-759-148-05	IC	CXA8010M
IC504	8-752-038-71	IC	CXA1127AM
IC505	8-752-035-48	IC	CXA1204Q
IC601	8-752-833-68	IC	CXP80116-851Q
IC602	8-759-502-36	IC	S-81350HG
IC603	8-759-987-66	IC	TL7757
IC604	8-759-100-95	IC	uPC324G2
IC607	8-759-100-93	IC	uPC393G2

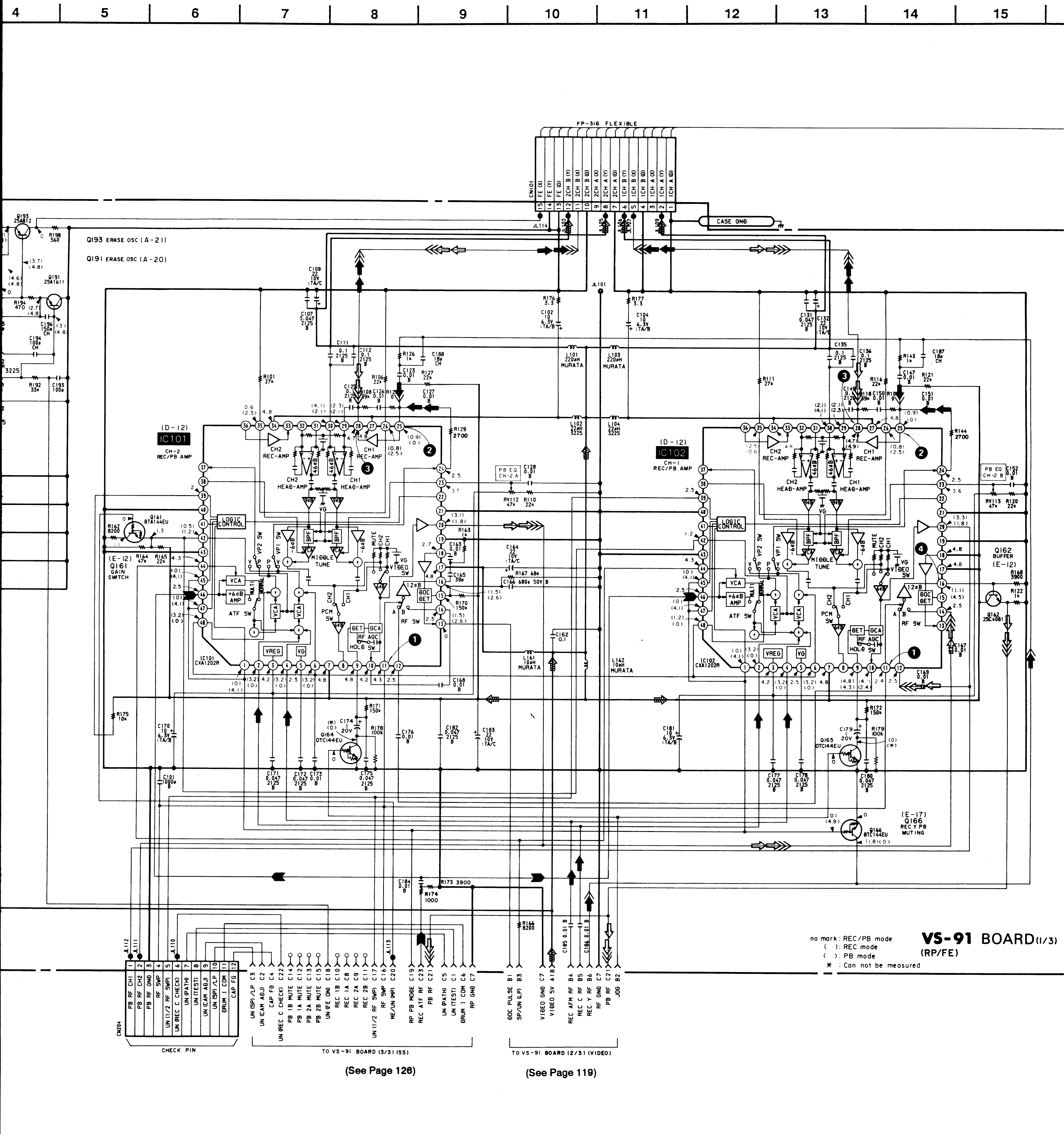
(TRANSISTOR)

Q161	8-729-403-35	TRANSISTOR	UN5113
Q162	8-729-117-32	TRANSISTOR	2SC4177
Q164	8-729-905-18	TRANSISTOR	DTC144EU
Q165	8-729-905-18	TRANSISTOR	DTC144EU
Q166	8-729-905-18	TRANSISTOR	DTC144EU
Q191	8-729-117-16	TRANSISTOR	2SA1611-M6
Q193	8-729-216-22	TRANSISTOR	2SA1162
Q201	8-729-101-07	TRANSISTOR	2SB798-DL
Q202	8-729-905-24	TRANSISTOR	2SA1576-S
Q203	8-729-905-24	TRANSISTOR	2SA1576-S
Q204	8-729-905-18	TRANSISTOR	DTC144EU
Q205	8-729-905-24	TRANSISTOR	2SA1576-S
Q208	8-729-102-07	TRANSISTOR	2SC2223-F13
Q209	8-729-905-18	TRANSISTOR	DTC144EU
Q212	8-729-905-24	TRANSISTOR	2SA1576-S
Q213	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q214	8-729-117-32	TRANSISTOR	2SC4177
Q217	8-729-102-07	TRANSISTOR	2SC2223-F13
Q218	8-729-117-32	TRANSISTOR	2SC4177
Q219	8-729-905-24	TRANSISTOR	2SA1576-S
Q220	8-729-117-32	TRANSISTOR	2SC4177
Q221	8-729-403-35	TRANSISTOR	UN5113
Q222	8-729-117-32	TRANSISTOR	2SC4177
Q223	8-729-905-24	TRANSISTOR	2SA1576-S
Q224	8-729-403-35	TRANSISTOR	UN5113
Q225	8-729-117-32	TRANSISTOR	2SC4177
Q227	8-729-905-24	TRANSISTOR	2SA1576-S
Q228	8-729-117-32	TRANSISTOR	2SC4177
Q229	8-729-905-15	TRANSISTOR	DTC144WU
Q230	8-729-117-32	TRANSISTOR	2SC4177
Q231	8-729-905-15	TRANSISTOR	DTC144WU
Q232	8-729-140-88	TRANSISTOR	FPIA3M
Q233	8-729-117-32	TRANSISTOR	2SC4177
Q234	8-729-117-32	TRANSISTOR	2SC4177
Q235	8-729-905-24	TRANSISTOR	2SA1576-S
Q236	8-729-117-16	TRANSISTOR	2SA1611-M6
Q237	8-729-117-16	TRANSISTOR	2SA1611-M6
Q238	8-729-102-07	TRANSISTOR	2SC2223-F13
Q239	8-729-117-32	TRANSISTOR	2SC4177
Q241	8-729-905-24	TRANSISTOR	2SA1576-S
Q242	8-729-905-18	TRANSISTOR	DTC144EU
Q243	8-729-905-12	TRANSISTOR	DTA144EU
Q244	8-729-420-12	TRANSISTOR	XN4213
Q245	8-729-102-07	TRANSISTOR	2SC2223-F13
Q246	8-729-117-32	TRANSISTOR	2SC4177
Q247	8-729-117-32	TRANSISTOR	2SC4177
Q248	8-729-403-35	TRANSISTOR	UN5113
Q249	8-729-420-12	TRANSISTOR	XN4213
Q250	8-729-403-35	TRANSISTOR	UN5113
Q251	8-729-905-18	TRANSISTOR	DTC144EU
Q252	8-729-117-32	TRANSISTOR	2SC4177
Q253	8-729-117-32	TRANSISTOR	2SC4177
Q254	8-729-403-35	TRANSISTOR	UN5113
Q256	8-729-905-18	TRANSISTOR	DTC144EU
Q258	8-729-921-08	TRANSISTOR	DTC144TU
Q259	8-729-921-58	TRANSISTOR	DTA144TU
Q260	8-729-117-32	TRANSISTOR	2SC4177
Q261	8-729-905-24	TRANSISTOR	2SA1576-S
Q270	8-729-905-24	TRANSISTOR	2SA1576-S
Q272	8-729-905-24	TRANSISTOR	2SA1576-S
Q501	8-729-920-39	TRANSISTOR	IMT-1US
Q541	8-729-905-24	TRANSISTOR	2SA1576-S
Q542	8-729-117-32	TRANSISTOR	2SC4177
Q543	8-729-905-24	TRANSISTOR	2SA1576-S
Q571	8-729-920-39	TRANSISTOR	IMT-1US
Q572	8-729-920-39	TRANSISTOR	IMT-1US
Q573	8-729-117-32	TRANSISTOR	2SC4177
Q601	8-729-403-24	TRANSISTOR	XN4210
Q602	8-729-403-24	TRANSISTOR	XN4210
Q603	8-729-403-24	TRANSISTOR	XN4210
Q604	8-729-403-24	TRANSISTOR	XN4210
Q606	8-729-403-24	TRANSISTOR	XN4210
Q607	8-729-403-24	TRANSISTOR	XN4210
Q608	8-729-403-24	TRANSISTOR	XN4210
Q609	8-729-403-24	TRANSISTOR	XN4210
Q610	8-729-403-24	TRANSISTOR	XN4210
Q611	8-729-420-12	TRANSISTOR	XN4213
Q612	8-729-403-35	TRANSISTOR	UN5113
Q613	8-729-402-42	TRANSISTOR	UN5213
Q613	8-729-905-18	TRANSISTOR	DTC144EU
Q614	8-729-903-97	TRANSISTOR	FMS1FE
Q615	8-729-903-82	TRANSISTOR	FMW2
Q616	8-729-117-32	TRANSISTOR	2SC4177
Q617	8-729-903-10	TRANSISTOR	FMW1
Q618	8-729-903-10	TRANSISTOR	FMW1
Q619	8-729-907-00	TRANSISTOR	DTC114EU
Q620	8-729-421-90	TRANSISTOR	XN4113
Q621	8-729-420-12	TRANSISTOR	XN4213
Q623	8-729-117-32	TRANSISTOR	2SC4177
Q643	8-729-403-24	TRANSISTOR	XN4210
Q644	8-729-403-35	TRANSISTOR	UN5113
Q645	8-729-905-18	TRANSISTOR	DTC144EU
Q661	8-729-117-32	TRANSISTOR	2SC4177
Q662	8-729-905-24	TRANSISTOR	2SA1576-S
Q663	8-729-117-32	TRANSISTOR	2SC4177
Q664	8-729-905-24	TRANSISTOR	2SA1576-S
Q665	8-729-117-32	TRANSISTOR	2SC4177
Q681	8-729-117-32	TRANSISTOR	2SC4177
Q682	8-729-822-84	TRANSISTOR	2SB1202FAST

VS-91 (HEAD AMP) SCHEMATIC DIAGRAM

— Ref. No. VS-91 BOARD: 2000 series —




FP-316 FLEXIBLE
CN101
CASE GND
Q193 ERASE OSC (A-21)
Q191 ERASE OSC (A-20)
(D-12) IC101 CH-2 REC/PB AMP
(D-12) IC102 CH-1 REC/PB AMP
IC101 CXA1202R
IC102 CXA1202R
LOGIC CONTROL
CH2 REC-AMP
CH1 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
MIDDLE TUNE
VIDEO SW
ATF SW
PCM SW
RF SW
RF AGC
HOLD SW
VREG
VG
VCA
+6dB AMP
DOC DET
(E-12) Q161 GAIN SWITCH
Q164 DTC144EU
Q165 DTC144EU
Q162 BUFFER (E-12)
(E-17) Q166 REC Y PB MUTING
PB EQ CH-2 A
PB EQ CH-2 B
L101 220μH MURATA
L103 220μH MURATA
L161 10μH MURATA
L162 10μH MURATA
CN204
CHECK PIN
PB RF CH1
PB RF CH2
PB RF GND
RF SWP
UN (1/2 RF SWP)
UN (REC C CHECK)
UN (PATH)
UN (TEST)
UN (CAM ADJ)
UN (SP)/LP
DRUM 1 COM
CAP FG
TO VS-91 BOARD (3/3) (SS)
TO VS-91 BOARD (2/3) (VIDEO)
4
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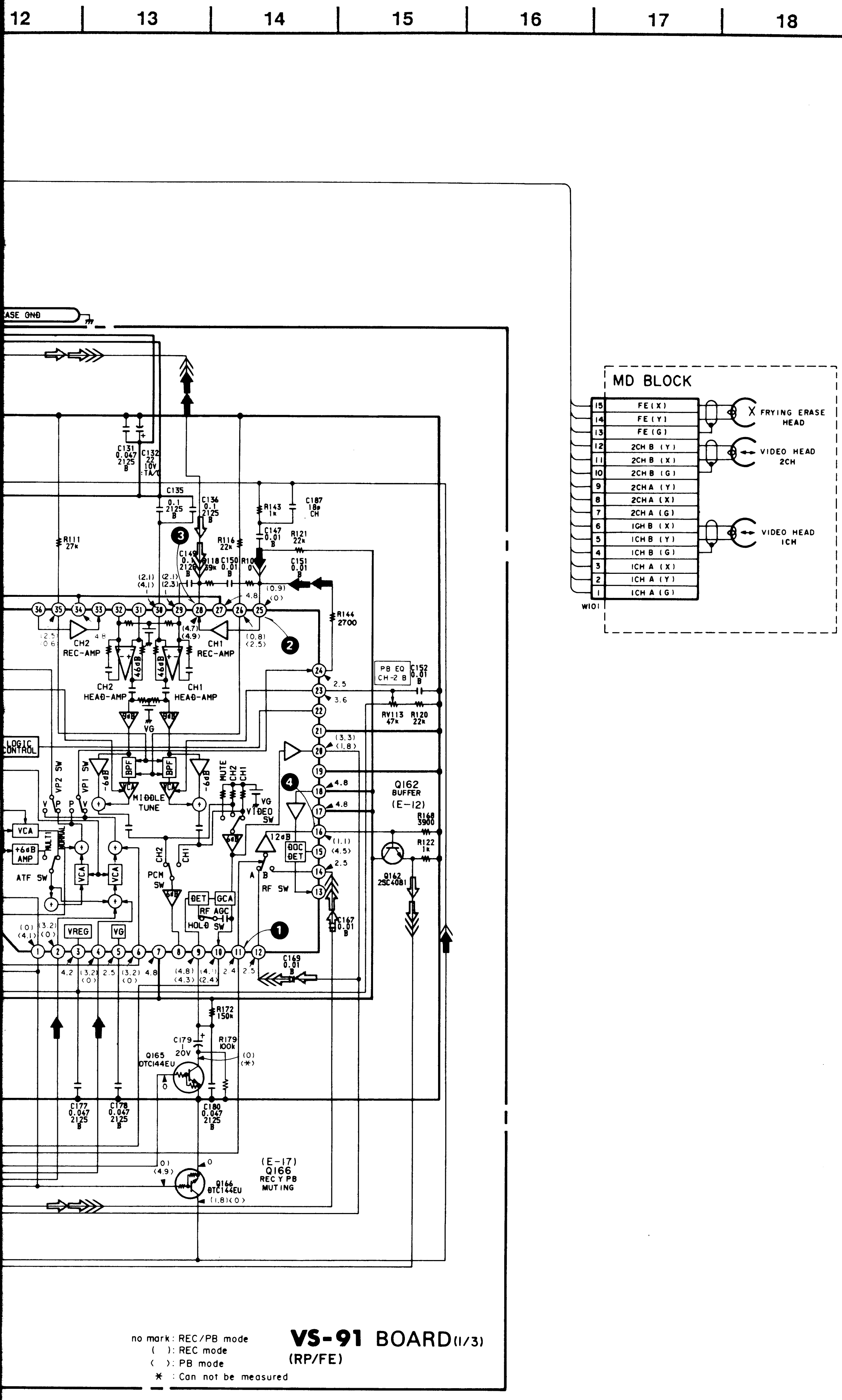
15

no mark : REC/PB mode
( ): REC mode
〈 〉: PB mode
✱ : Can not be measured

VS-91 BOARD(1/3)
(RP/FE)

(See Page 126)

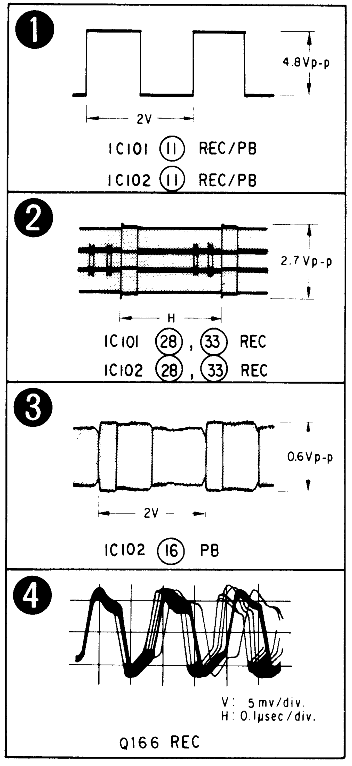
(See Page 119)


12
13
14
15
16
17
18
19
MD BLOCK
FE(X)
FE(Y)
FE(G)
2CH B (Y)
2CH B (X)
2CH B (G)
2CH A (Y)
2CH A (X)
2CH A (G)
1CH B (X)
1CH B (Y)
1CH B (G)
1CH A (X)
1CH A (Y)
1CH A (G)
W101
FRYING ERASE HEAD
VIDEO HEAD 2CH
VIDEO HEAD 1CH
CH2 REC-AMP
CH1 REC-AMP
CH2 HEAD-AMP
CH1 HEAD-AMP
MIDDLE TUNE
VIDEO SW
RF SW
PCM SW
RF AGC
HOLD SW
DOC DET
LOGIC CONTROL
VCA
+6dB AMP
ATF SW
VREG
VG
PB EQ CH-2 B
Q162 BUFFER (E-12)
Q162 2SC4081
Q165 DTC144EU
(E-17) Q166 REC Y PB MUTING
Q166 DTC144EU

no mark : REC/PB mode
( ) : REC mode
( ) : PB mode
✱ : Can not be measured

VS-91 BOARD (1/3)
(RP/FE)

VS-91 BOARD (1/3)

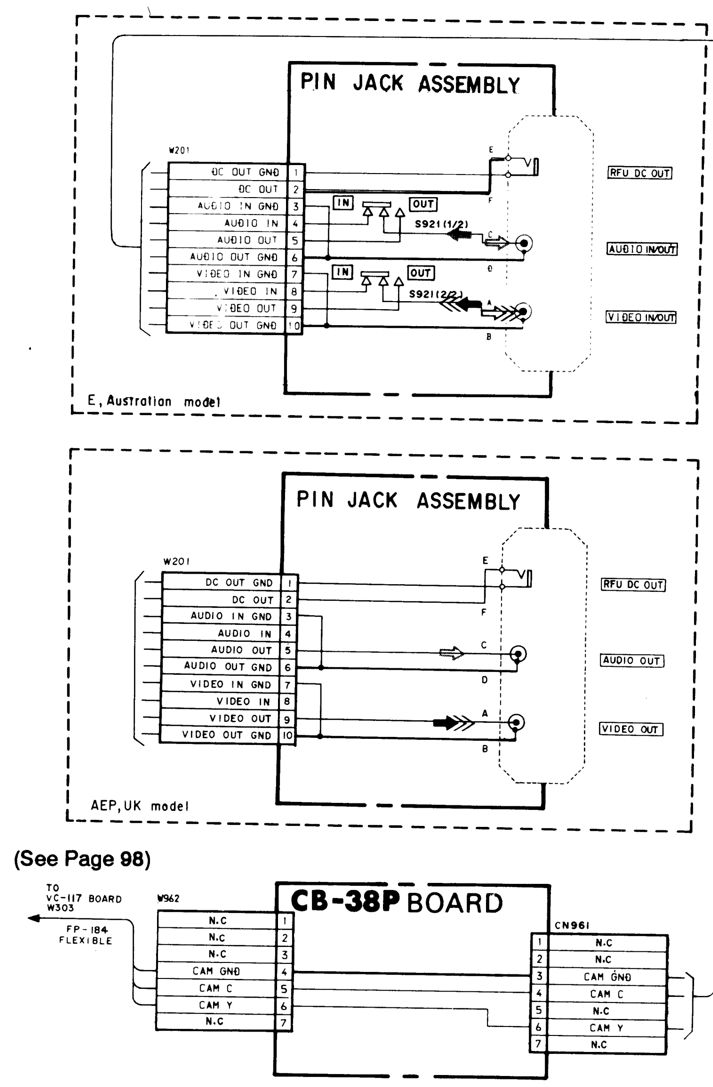


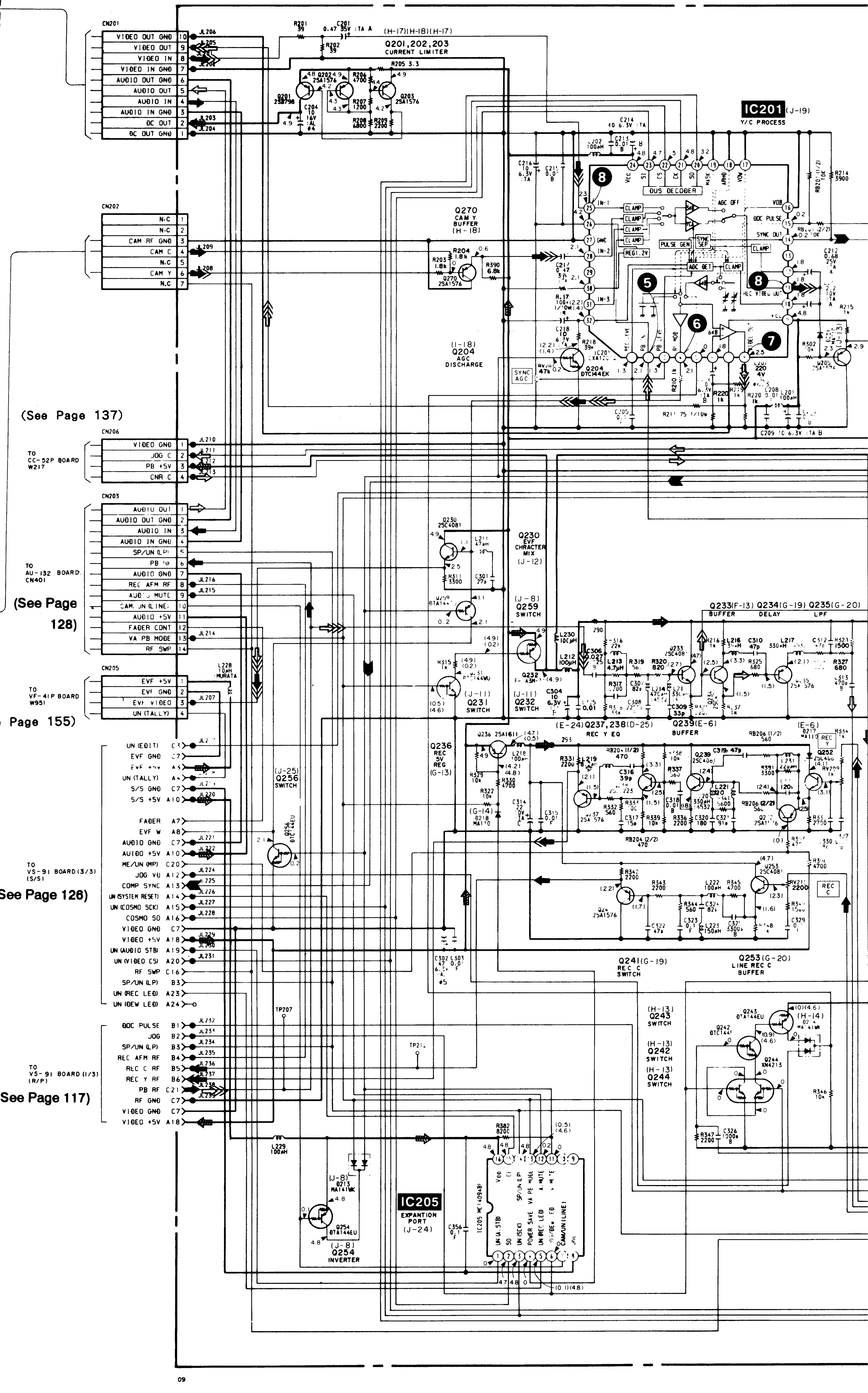
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡»	➡⋙	➡
PB			⇨⋙	⇨

VS-91 (VIDEO), CB-38P (BOARD LINK), PIN JACK ASSEMBLY (TERMINAL) SCHEMATIC DIAGRAMS

— Ref. No. VS-91, CB-38P BOARDS: 2000 series —


PIN JACK ASSEMBLY
W201
DC OUT GND
DC OUT
AUDIO IN GND
AUDIO IN
AUDIO OUT
AUDIO OUT GND
VIDEO IN GND
VIDEO IN
VIDEO OUT
VIDEO OUT GND
IN
OUT
S921(1/2)
S921(2/2)
RFU DC OUT
AUDIO IN/OUT
VIDEO IN/OUT
E, Australian model
PIN JACK ASSEMBLY
RFU DC OUT
AUDIO OUT
VIDEO OUT
AEP, UK model
(See Page 98)
TO VC-117 BOARD W303
FP-184 FLEXIBLE
W962
CB-38P BOARD
CN961
N.C
CAM GND
CAM C
CAM Y

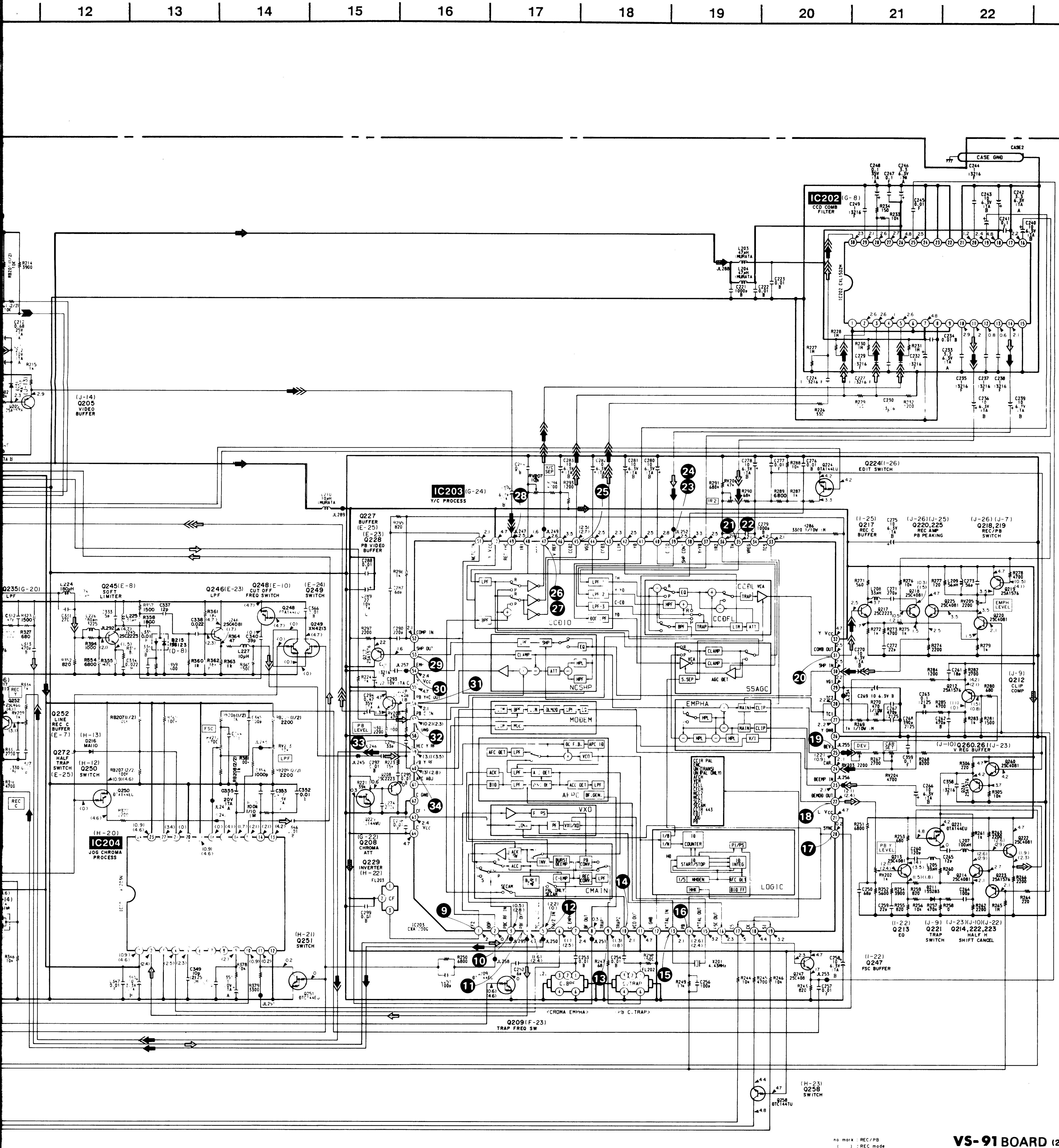

CN201
CN202
CN206
CN203
CN205
(See Page 137)
TO CC-52P BOARD W217
TO AU-132 BOARD CN401
(See Page 128)
TO VF-41P BOARD W951
(See Page 155)
TO VS-91 BOARD (3/3) (S/S)
(See Page 126)
TO VS-91 BOARD (1/3) (R/P)
(See Page 117)
Q201,202,203 CURRENT LIMITER
IC201 (J-19) Y/C PROCESS
BUS DECODER
Q270 CAM Y BUFFER (H-18)
Q204 AGC DISCHARGE
Q230 EVF CHARACTER MIX (J-12)
Q259 SWITCH
Q231 SWITCH
Q232 SWITCH
Q256 SWITCH
Q236 REC 5V REG
Q237,238 REC Y EQ
Q239 BUFFER
Q233 BUFFER
Q234 DELAY
Q235 LPF
Q241 REC C SWITCH
Q253 LINE REC C BUFFER
Q243 SWITCH
Q242 SWITCH
Q244 SWITCH
IC205 EXPANTION PORT (J-24)
Q213
Q254 INVERTER
TP707
TP71
09

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC	➡	➡➡	➡➡➡	
PB	⇨	⇨⇨	⇨⇨⇨	

- **SIGNAL PATH**

	REC	REC/PB	PB
Drum speed servo			
Drum phase servo			
Drum servo (speed and phase)			
Capstan speed servo			
Capstan phase servo			
Capstan servo (speed and phase)			
Ref. signal	➤		


12
13
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21
22
CASE GND
IC202 (G-8)
CCD COMB FILTER
IC202 CXL1502M
IC203 (G-24)
Y/C PROCESS
IC203 CXA1006
IC204
(H-20)
JOG CHROMA PROCESS
CCD10
CCDFL
NCSHP
SSAGC
MODEM
EMPHA
AFPC
VXO
CMAIN
LOGIC
Q205 (J-14) VIDEO BUFFER
Q224 (I-26) EDIT SWITCH
Q227 BUFFER (E-25)
Q228 (E-23) PB VIDEO BUFFER
Q245 (E-8) SOFT LIMITER
Q246 (E-23) LPF
Q248 (E-10) CUT OFF FREQ SWITCH
Q249 (E-24) SWITCH
Q252 LINE REC C BUFFER (E-7)
Q272 HALF TRAP SWITCH (E-25)
D216 MA110 (H-13)
Q250 SWITCH (H-12)
Q251 SWITCH (H-21)
Q208 CHROMA ATT (G-22)
Q229 INVERTER (H-22)
Q209 (F-23) TRAP FREQ SW
Q217 (I-25) REC C BUFFER
Q220,225 (J-26)(J-25) REC AMP PB PEAKING
Q218,219 (J-26)(J-7) REC/PB SWITCH
Q212 (J-9) CLIP COMP
Q260,261 (J-10)(J-23) V REG BUFFER
Q213 (I-22) EQ
Q221 (J-9) TRAP SWITCH
Q214,222,223 (J-23)(J-10)(J-22) HALF H SHIFT CANCEL
Q247 (I-22) FSC BUFFER
Q258 (H-23) SWITCH
<CROMA EMPHA>
PB C.TRAP
FL202
FL203
C.BPF
C.TRAP
X201 4.43MHz
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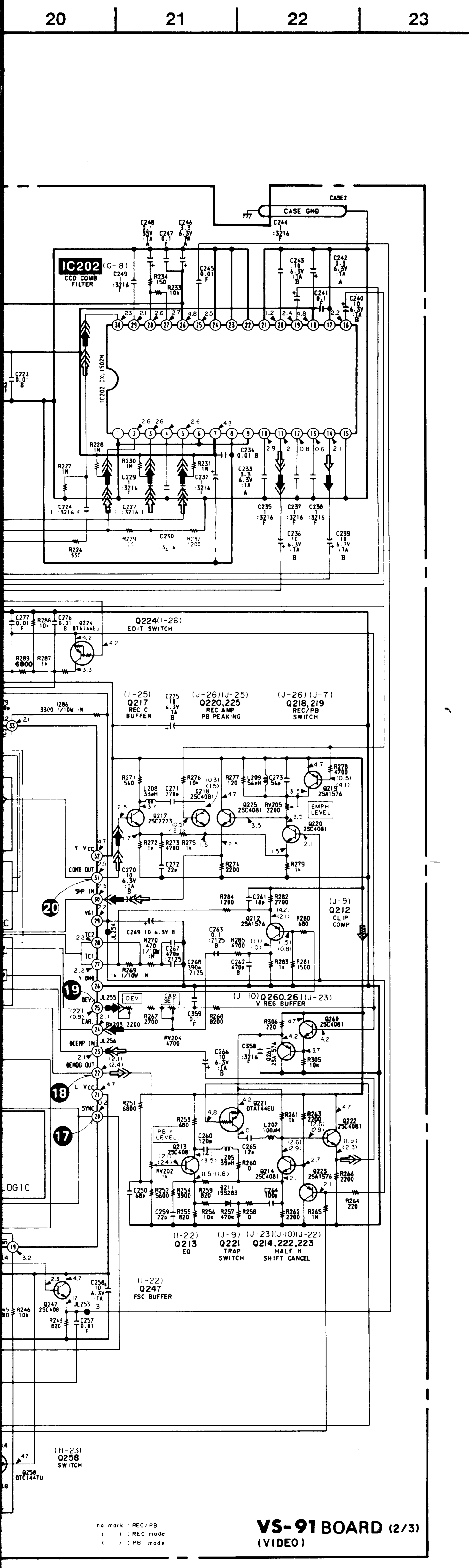
no mark : REC/PB
( ) : REC mode
( ) : PB mode

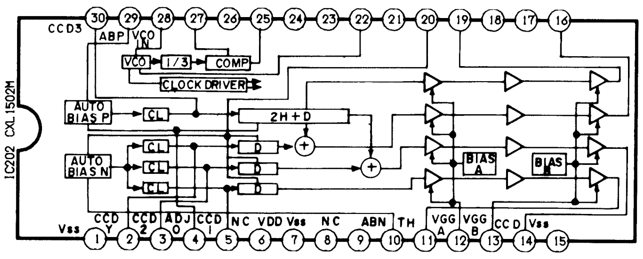
VS-91 BOARD (2/3
(VIDEO)


20
21
22
23
CASE2
CASE GND
IC202 (G-8)
CCD COMB FILTER
IC202 CXL1502M
Q224 (I-26)
EDIT SWITCH
(I-25) Q217
REC C BUFFER
(J-26)(J-25) Q220,225
REC AMP PB PEAKING
(J-26)(J-7) Q218,219
REC/PB SWITCH
EMPH LEVEL
(J-9) Q212
CLIP COMP
(J-10) Q260,261 (J-23)
V REG BUFFER
DEV
CAR SET
PB Y LEVEL
Y OUT
COMB OUT
SHP IN
YG1
TC1
BEEMP IN
BEMOD OUT
L VCC
SYNC
LOGIC
(I-22) Q213
EQ
(J-9) Q221
TRAP SWITCH
(J-23)(J-10)(J-22) Q214,222,223
HALF H SHIFT CANCEL
(I-22) Q247
FSC BUFFER
(H-23) Q258
SWITCH

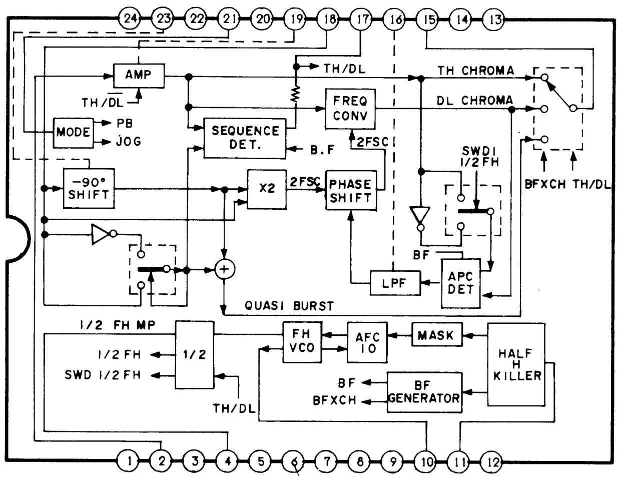
no mark : REC/PB
( ) : REC mode
< > : PB mode

VS-91 BOARD (2/3)
(VIDEO)

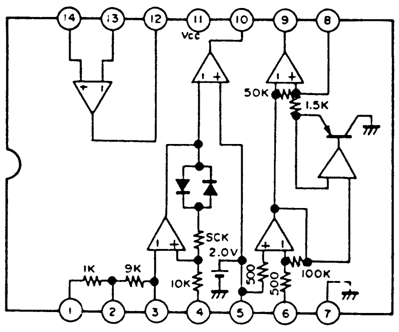
IC204 CXA1203N


CCD3
ABP
VCO IN
VCO
1/3
COMP
CLOCK DRIVER
AUTO BIAS P
CL
2H+D
AUTO BIAS N
D
BIAS A
BIAS B
IC202 CXL1502M
Vss
CCD Y
CCD 2
ADJ
CCD
NC
VDD
Vss
NC
ABN
TH
VGG A
VGG B
CCD Vss

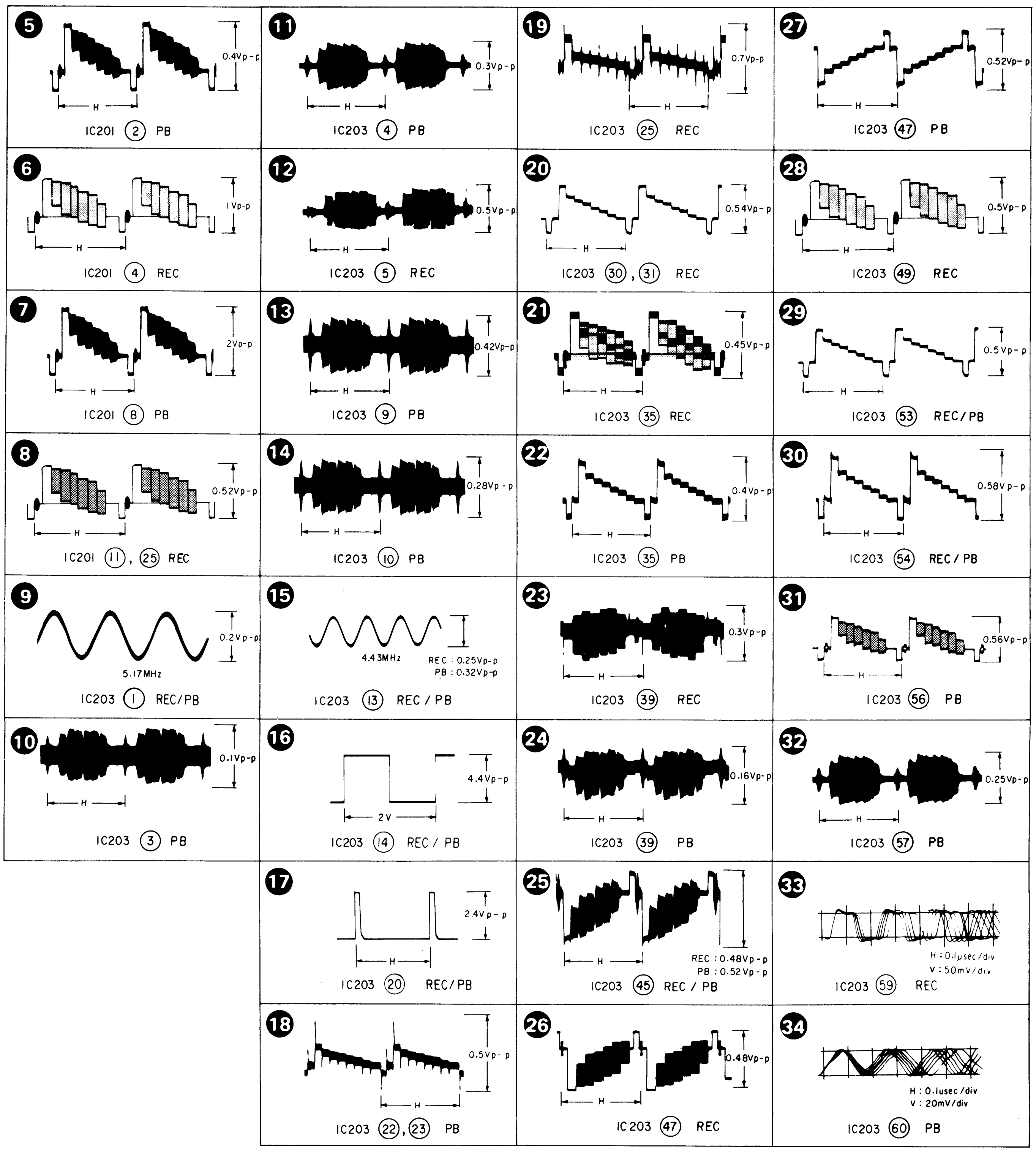
IC202 CXL1502M


AMP
TH/DL
TH CHROMA
DL CHROMA
FREQ CONV
MODE
PB
JOG
SEQUENCE DET.
B.F
2FSC
-90° SHIFT
X2
2FSC
PHASE SHIFT
SWD1 1/2FH
BFXCH TH/DL
BF
LPF
APC DET
QUASI BURST
1/2 FH MP
1/2FH
SWD 1/2FH
1/2
FH VCO
AFC 1/0
MASK
HALF H KILLER
BF
BFXCH
BF GENERATOR
TH/DL

IC502 CXA8006M

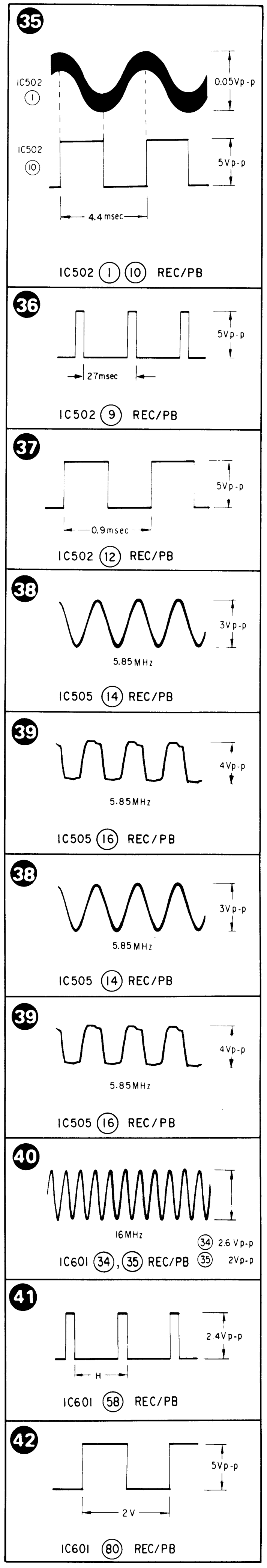

VCC
50K
1.5K
5CK
2.0V
1K
9K
10K
500
500
100K

VS-91 BOARD (2/3)

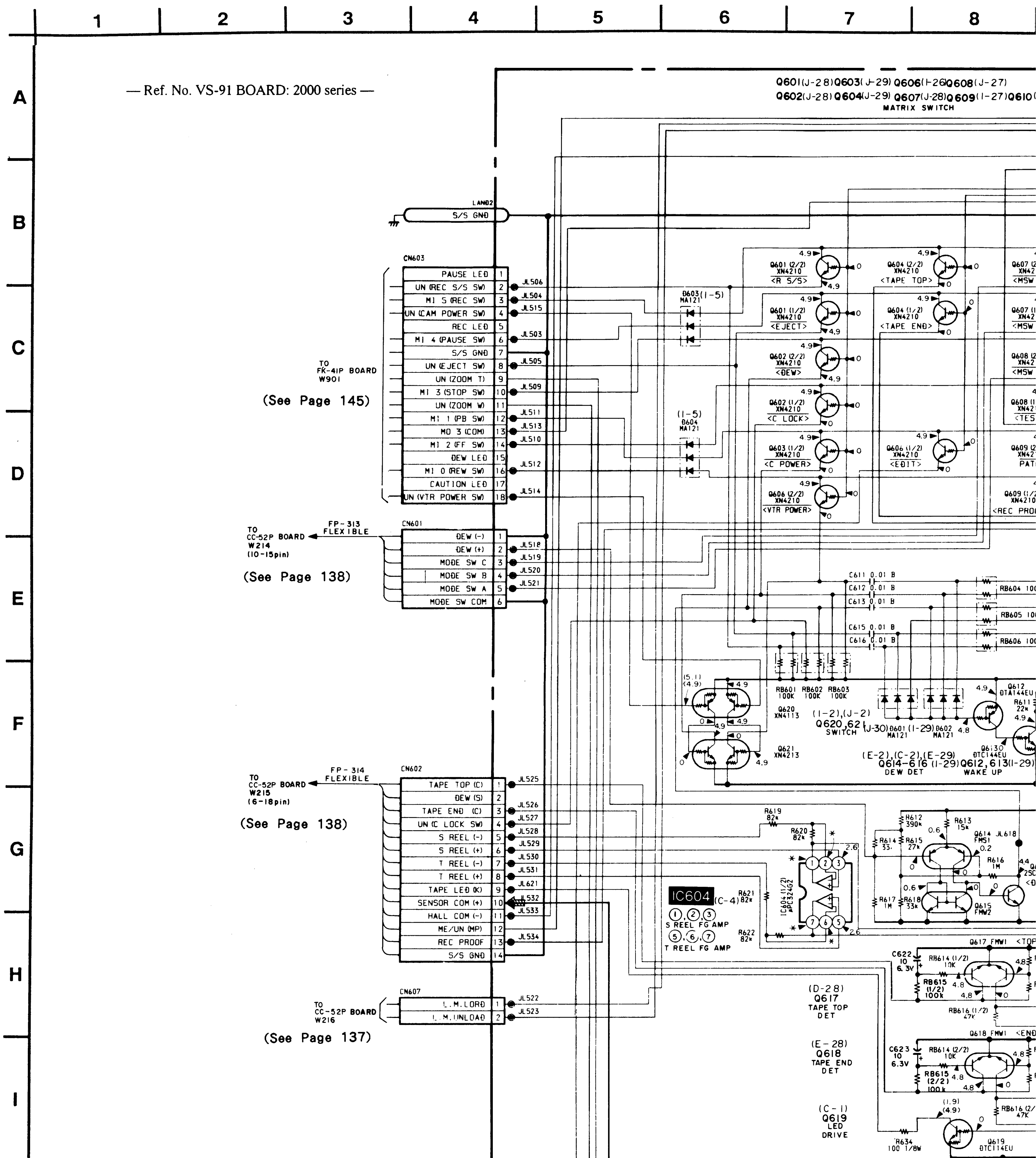


VS-91 (SERVO/SYSTEM CONTROL) SCHEMATIC DIAGRAM

VS-91 BOARD (3/3)



— Ref. No. VS-91 BOARD: 2000 series —



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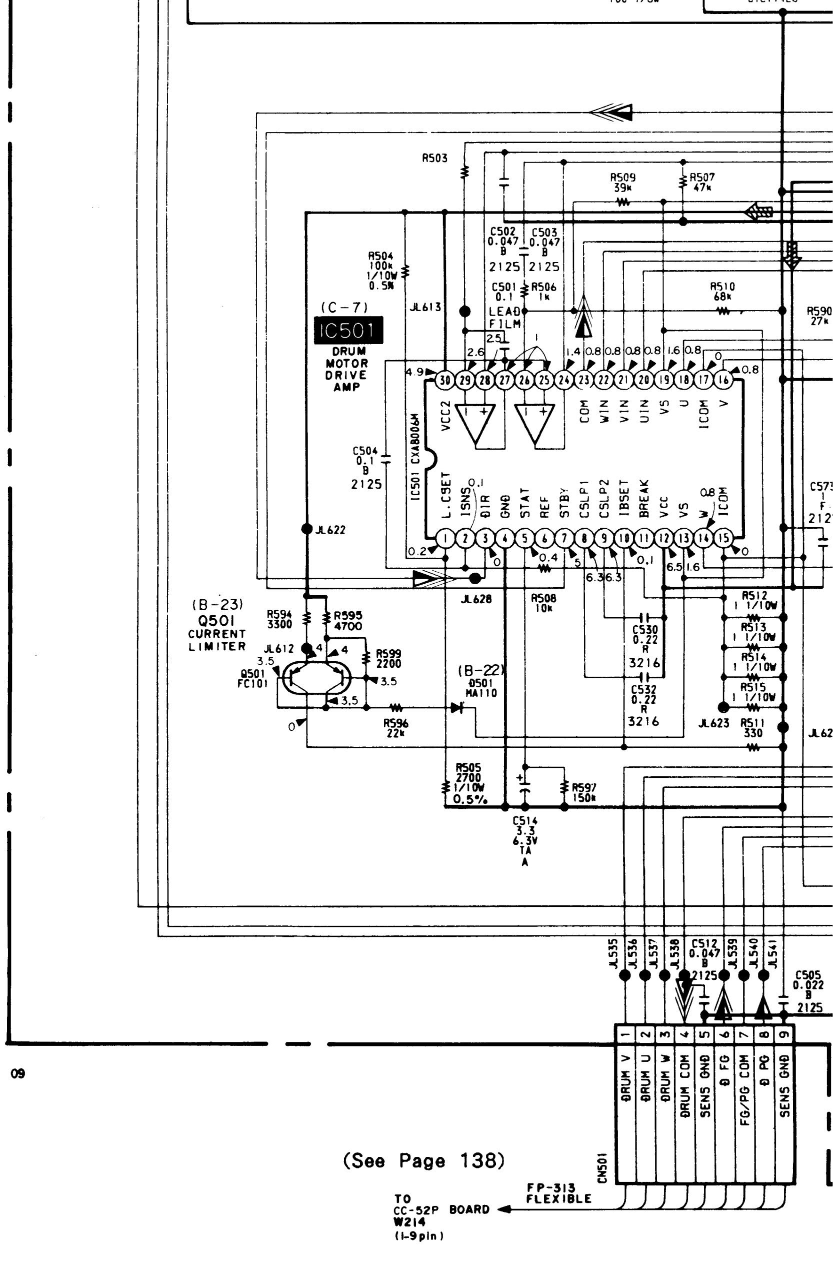
7
8
A
B
C
D
E
F
G
H
I
Q601(J-28)Q603(J-29)Q606(I-26)Q608(J-27)
Q602(J-28)Q604(J-29)Q607(J-28)Q609(I-27)Q610
MATRIX SWITCH
S/S GND
CN603
PAUSE LED
UN (REC S/S SW)
MI 5 (REC SW)
UN (CAM POWER SW)
REC LED
MI 4 (PAUSE SW)
S/S GND
UN (EJECT SW)
UN (ZOOM T)
MI 3 (STOP SW)
UN (ZOOM W)
MI 1 (PB SW)
MD 3 (COM)
MI 2 (FF SW)
DEW LED
MI 0 (REW SW)
CAUTION LED
UN (VTR POWER SW)
TO FK-41P BOARD W901
(See Page 145)
CN601
DEW (-)
DEW (+)
MODE SW C
MODE SW B
MODE SW A
MODE SW COM
TO CC-52P BOARD W214 (10-15pin)
FP-313 FLEXIBLE
(See Page 138)
CN602
TAPE TOP (C)
DEW (S)
TAPE END (C)
UN (C LOCK SW)
S REEL (-)
S REEL (+)
T REEL (-)
T REEL (+)
TAPE LED (K)
SENSOR COM (+)
HALL COM (-)
ME/UN (MP)
REC PROOF
S/S GND
TO CC-52P BOARD W215 (6-18pin)
FP-314 FLEXIBLE
(See Page 138)
CN607
L.M.LOAD
L.M.UNLOAD
TO CC-52P BOARD W216
(See Page 137)
<R S/S>
<TAPE TOP>
<EJECT>
<TAPE END>
<DEW>
<C LOCK>
<C POWER>
<EDIT>
<VTR POWER>
XN4210
Q620,621 (I-2),(J-2) SWITCH
D601 (I-29) D602 MA121
Q614-616 (E-2),(C-2),(E-29) DEW DET
Q612,613 (I-29) WAKE UP
IC604 (C-4)
①,②,③ S REEL FG AMP
⑤,⑥,⑦ T REEL FG AMP
Q617 (D-28) TAPE TOP DET
Q618 (E-28) TAPE END DET
Q619 (C-1) LED DRIVE

- **SIGNAL PATH**

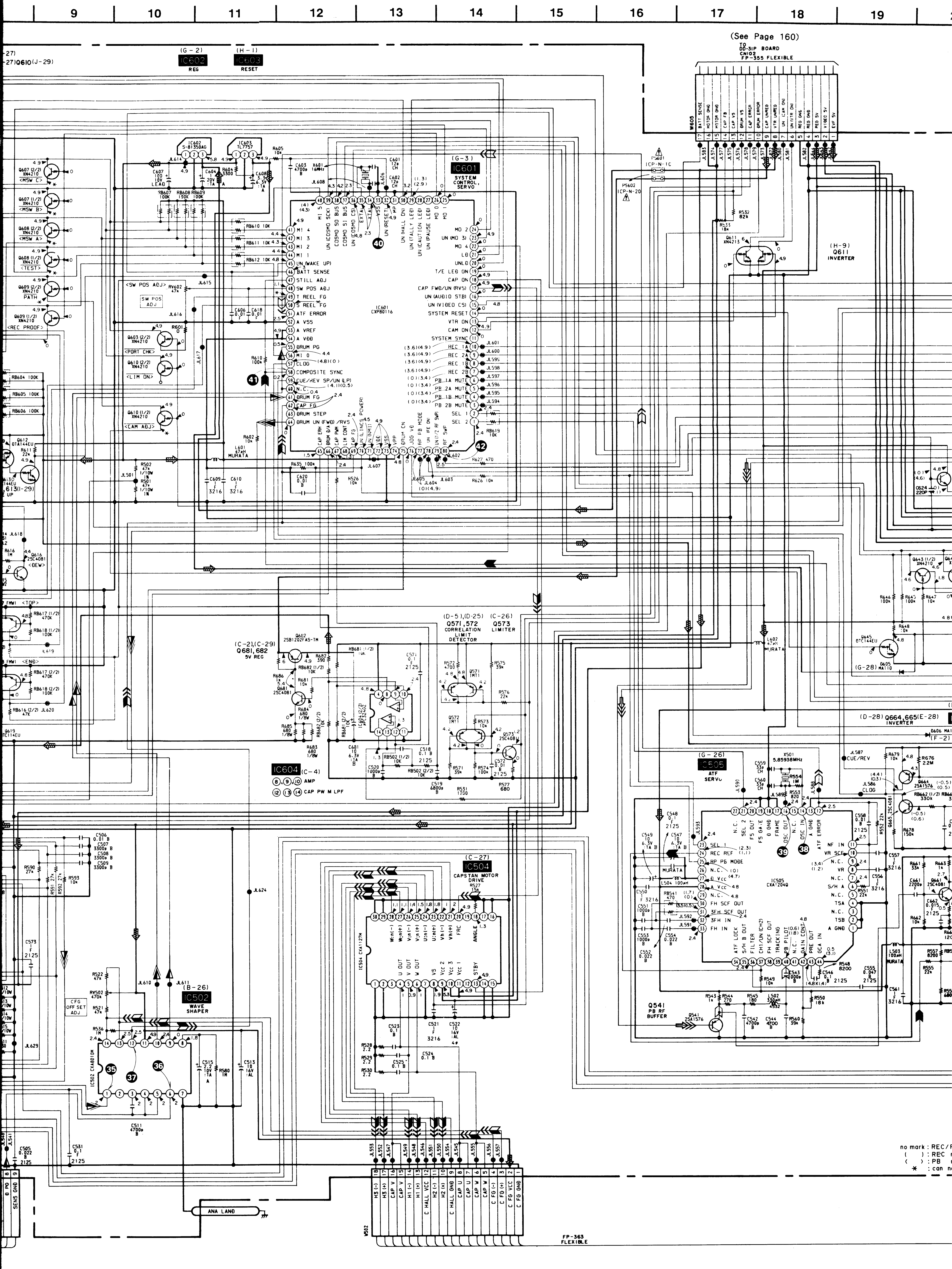
	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB			⇨≫	

- **SIGNAL PATH**

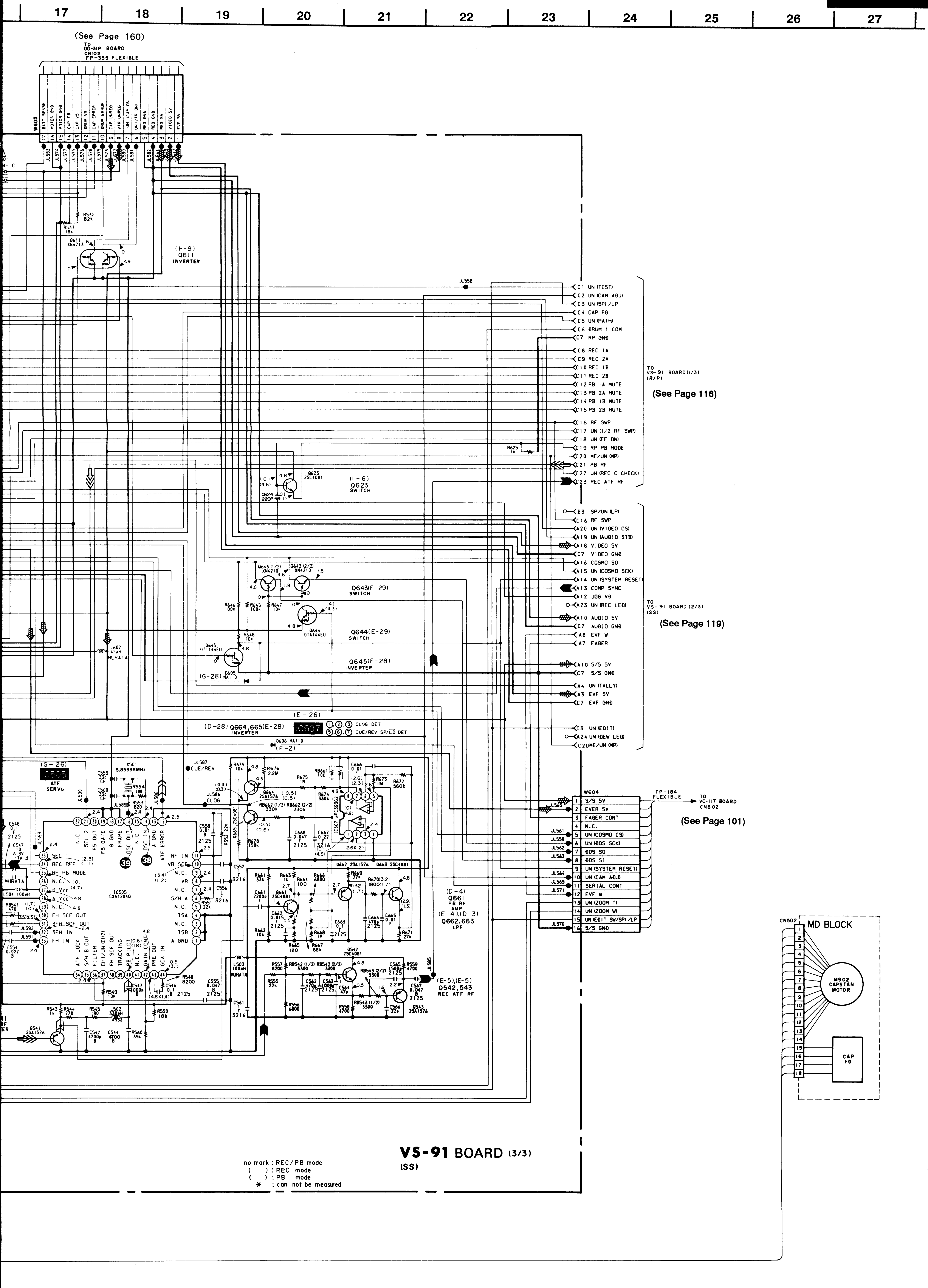
	REC	REC/PB	PB
Drum speed servo		▷	
Drum phase servo		▷▷	
Drum servo (speed and phase)		▷▷▷	
Capstan speed servo			
Capstan phase servo			⊃⟩
Capstan servo (speed and phase)		⊃⟩⟩	
Ref. signal	➤		⊃



J
K
L
M
N
O
P
IC501 (C-7) DRUM MOTOR DRIVE AMP
CXA8006M
Q501 (B-23) CURRENT LIMITER
D501 (B-22) MA110
CN501
DRUM V
DRUM U
DRUM W
DRUM COM
SENS GND
D FG
FG/PG COM
D PG
SENS GND
(See Page 138)
TO CC-52P BOARD W214 (1-9pin)
FP-313 FLEXIBLE


9
10
11
12
13
14
15
16
17
18
19
(G-2) IC602 REG
(H-1) IC603 RESET
IC602 S-81350AG
IC603 TL7757
(G-3) IC601 SYSTEM CONTROL, SERVO
IC601 CXP80116
(See Page 160)
TO DD-31P BOARD CN102 FP-355 FLEXIBLE
W605
BATT SENSE
MOTOR GND
MOTOR GND
CAP FB
CAP V5
DRUM V5
CAP ERROR
DRUM ERROR
CAP UNREG
VTR UNREG
UN/CAM ON
UN/VTR ON
REG GND
REG GND
REG 5V
VIDEO 5V
EVF 5V
PS601 ICP-N-10
PS602 ICP-N-20
(H-9) Q611 INVERTER
Q611 XN4213
Q607 (2/2) XN4210 <MSW C>
Q607 (1/2) XN4210 <MSW B>
Q608 (2/2) XN4210 <MSW A>
Q608 (1/2) XN4210 <TEST>
Q609 (2/2) XN4210 PATH
Q609 (1/2) XN4210 <REC PROOF>
Q603 (2/2) XN4210 <PORT CHK>
Q610 (2/2) XN4210 <LIM ON>
Q610 (1/2) XN4210 <CAM ADJ>
Q612 DTA144EU
<SW POS ADJ> RV602 47k
SW POS ADJ
L601 47µH MURATA
MI 5
UN (COSMO SCK)
COSMO SO BUS
COSMO SI BUS
UN (COSMO CS)
EXT1
EXT0
VSS
UN (RESET)
VPP
UN (HALL ON)
UN (TALLY LED)
UN (CAUTION LED)
UN (PAUSE LED)
MO 0
MO 1
MI 4
MI 3
MI 2
MI 1
UN (WAKE UP)
BATT SENSE
STILL ADJ
SW POS ADJ
T REEL FG
S REEL FG
ATF ERROR
A VSS
A VREF
A VDD
DRUM PG
MI 0
CLOG
COMPOSITE SYNC
CUE/REV SP/UN (LP)
N.C.
DRUM FG
CAP FG
DRUM STEP
DRUM UN (FWD) /RVS
MO 2
UN (MO 3)
MO 4
LB
UNLD
T/E LED ON
CAP ON
CAP FWD/UN (RVS)
UN (AUDIO STB)
UN (VIDEO CS)
SYSTEM RESET
VTR ON
CAM ON
SYSTEM SYNC
REC 1A
REC 2A
REC 1B
REC 2B
PB 1A MUTE
PB 2A MUTE
PB 1B MUTE
PB 2B MUTE
SEL 1
SEL 2
CAP ERR
DRUM ERR
CAP PWM
LIM CONT
CAP F/B
UN (LINE POWER)
UN (MT)
EVF
VDD
VSS
DRUM ON
JOG VD
RF PB MODE
UN (PB ON)
UN (1/2 RF SWP)
RF SWP
X601 16MHz
(C-2),(C-29) Q681,682 5V REG
Q682 2SB1202FAS-TM
Q681 2SC4081
(D-5),(D-25) Q571,572 CORRELATION LIMIT DETECTOR
(C-26) Q573 LIMITER
Q571 IMT1
Q572 IMT1
Q573 2SC4081
IC604 (C-4)
IC604 (2/2) UPC324G2
⑧⑨⑩ AMP
⑫⑬⑭ CAP PW M LPF
(C-27) IC504 CAPSTAN MOTOR DRIVE
IC504 CXA1127M
W in(-)
W in(+)
V in(-)
V in(+)
U in(-)
U in(+)
VH(+)
FRC
ANGLE
U OUT
V OUT
W OUT
VS
Vcc 2
Vcc 1
STBY
(B-26) IC502 WAVE SHAPER
IC502 CXA8010M
CFG OFF SET ADJ
RV502 470k
(G-26) IC505 ATF SERVO
IC505 CXA1204Q
X501 5.85938MHz
N.C.
SEL 2
FS GATE
D GND
FRAME
OSC OUT
N.C.
OSC IN
A GND
ATF ERROR
SEL 1
REC REF
RP PB MODE
N.C.
D Vcc
A Vcc
N.C.
FH SCF DET
3FH SCF OUT
3FH IN
FH IN
NF IN
VR SCF
N.C.
VR
N.C.
S/H A
N.C.
TSA
N.C.
TSB
A GND
ATF LOCK
S/H B OUT
FILTER
CH1/UN (CH2)
FH SCF OUT
FH TRACKING
PB PILOT
N.C.
GAIN CONT
PRE OUT
GCA IN
Q541 PB RF BUFFER
Q541 2SA1576
(D-28) Q664,665 (E-28) INVERTER
Q664 2SA1576
Q665 2SC4081
Q643 (1/2) XN4210
Q645 DTC144EU
Q605 MA110
Q616 2SC4081 <DEW>
Q619 DTC114EU
FMW1 <TOP>
FMW1 <END>
CUE/REV
CLOG
L602 47µH MURATA
L502 330µH 4532
L503 100µH MURATA
L504 100µH
MURATA
W502
H3 (-)
H3 (+)
CAP V
CAP V
H1 (+)
H1 (-)
C HALL VCC
H2 (+)
H2 (-)
C HALL GND
CAP U
CAP U
CAP W
CAP W
C FG (-)
C FG (+)
C FG VCC
C FG GND
FP-363 FLEXIBLE
D PG
SENS GND
ANA LAND
no mark : REC/
( ) : REC
( ) : PB
* : can n

SERVO/SYSTEM CONTRO

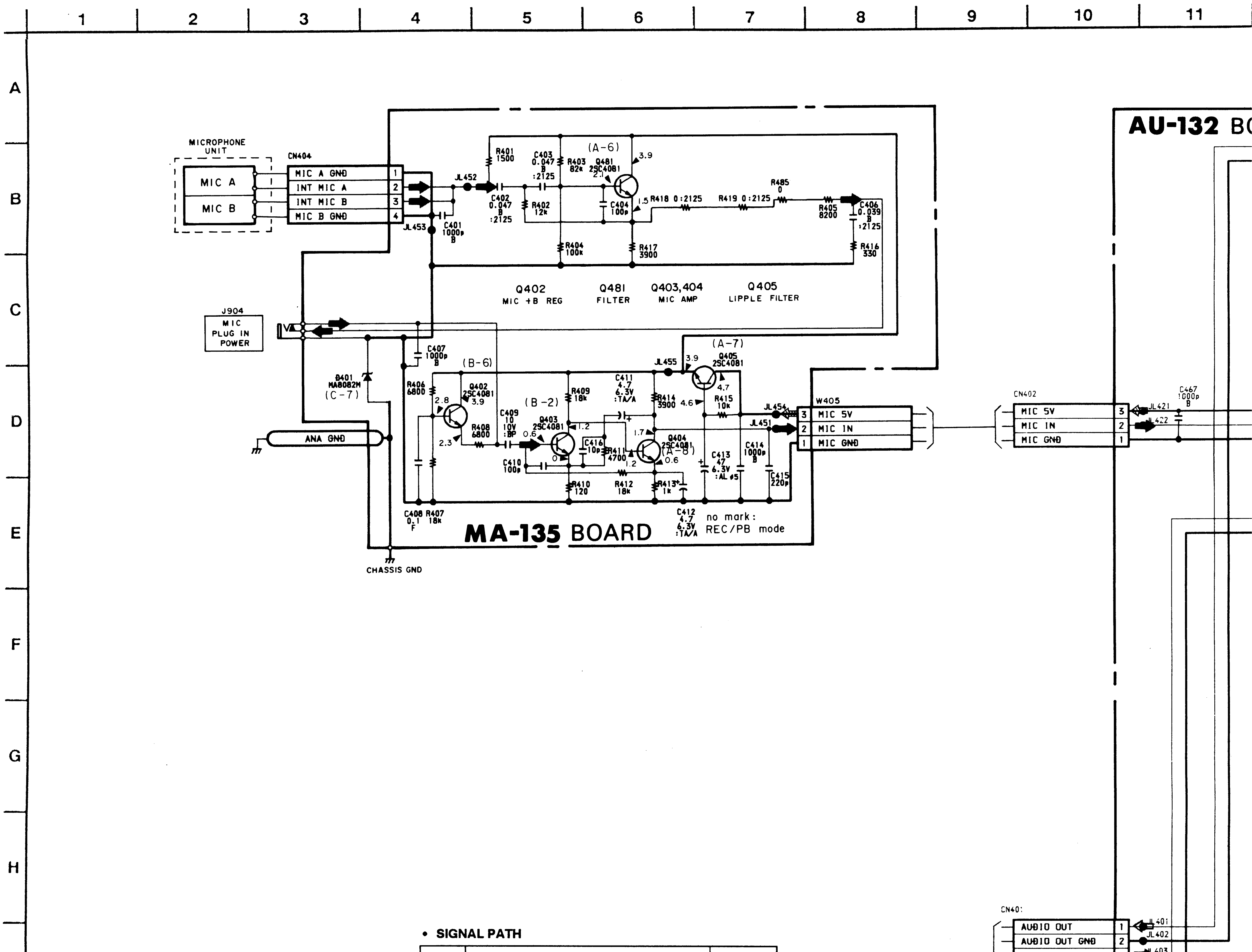

17
18
19
20
21
22
23
24
25
26
27
(See Page 160)
TO DD-31P BOARD CN102
FP-355 FLEXIBLE
W605
17 BATT SENSE
16 MOTOR GND
15 MOTOR GND
14 CAP FB
13 CAP VS
12 DRUM VS
11 CAP ERROR
10 DRUM ERROR
9 CAP UNREG
8 VTR UNREG
7 UN (CAM ON)
6 UN/VTR ON
5 REG GND
4 REG GND
3 REG 5V
2 VIDEO 5V
1 EVF 5V
R532 82k
R533 18k
Q611 XN4213
(H-9) Q611 INVERTER
C1 UN (TEST)
C2 UN (CAM ADJ)
C3 UN (SP)/LP
C4 CAP FG
C5 UN (PATH)
C6 DRUM 1 COM
C7 RP GND
C8 REC 1A
C9 REC 2A
C10 REC 1B
C11 REC 2B
C12 PB 1A MUTE
C13 PB 2A MUTE
C14 PB 1B MUTE
C15 PB 2B MUTE
C16 RF SWP
C17 UN (1/2 RF SWP)
C18 UN (FE ON)
C19 RP PB MODE
C20 ME/UN (MP)
C21 PB RF
C22 UN (REC C CHECK)
C23 REC ATF RF
TO VS-91 BOARD (1/3) (R/P)
(See Page 116)
R625 1k
Q623 2SC4081
(I-6) Q623 SWITCH
Q624 220P
B3 SP/UN (LP)
C16 RF SWP
A20 UN (VIDEO CS)
A19 UN (AUDIO STB)
A18 VIDEO 5V
C7 VIDEO GND
A16 COSMO SO
A15 UN (COSMO SCK)
A14 UN (SYSTEM RESET)
A13 COMP SYNC
A12 JOG VO
A23 UN (REC LED)
A10 AUDIO 5V
C7 AUDIO GND
A8 EVF W
A7 FADER
A10 S/S 5V
C7 S/S GND
A4 UN (TALLY)
A3 EVF 5V
C7 EVF GND
C3 UN (EDIT)
A24 UN (DEW LED)
C20 ME/UN (MP)
TO VS-91 BOARD (2/3) (SS)
(See Page 119)
Q643 (1/2) XN4210
Q643 (2/2) XN4210
Q643 (F-29) SWITCH
Q644 DTA144EU
Q644 (E-29) SWITCH
Q645 DTC144EU
Q645 (F-28) INVERTER
D605 MA110
(G-28)
R646 100k
R645 100k
R647 10k
R648 10k
L602 47μH MURATA
(E-26)
(D-28) Q664,665 (E-28) INVERTER
IC607 ①②③ CLOG DET ⑤⑥⑦ CUE/REV SP/LD DET
D606 MA110 (F-2)
(G-26) IC505 ATF SERVO
X501 5.85938MHz
JL587 CUE/REV
JL586 CLOG
Q664 2SA1576
Q665 2SC4081
IC607 μPC393G2
RB662 (1/2) RB662 (2/2) 330k
R676 2.2M
R679 10k
R675 1M
R674 330k
R673 1M
R672 560k
R678 150k
IC505 CXA1204Q
SEL 1
REC REF
RP PB MODE
N.C.
D VCC
A VCC
FH SCF OUT
3FH SCF OUT
3FH IN
FH IN
SEL 2
FS OUT
FS GATE
D GND
FRAME
OSC OUT
OSC IN
A GND
ATF ERROR
NF IN
VR SCF
VR
S/H A
TSA
TSB
A GND
ATF LOCK
S/H B OUT
FILTER
CH1/UN (CH2)
FH SCF OUT
TRACKING
PB PILOT
GAIN CONT
PRE OUT
GCA IN
Q662 2SA1576
Q663 2SC4081
Q661 2SC4081
(D-4) Q661 PB RF AMP
(E-4),(D-3) Q662,663 LPF
Q542 2SC4081
Q543 2SA1576
(E-5),(E-5) Q542,543 REC ATF RF
Q541 2SA1576
L503 100μH MURATA
L502 330μH
L504 100μH
W604
1 S/S 5V
2 EVER 5V
3 FADER CONT
4 N.C.
5 UN (COSMO CS)
6 UN (BOS SCK)
7 BOS SO
8 BOS SI
9 UN (SYSTEM RESET)
10 UN (CAM ADJ)
11 SERIAL CONT
12 EVF W
13 UN (ZOOM T)
14 UN (ZOOM W)
15 UN (EDIT SW/SP)/LP
16 S/S GND
FP-184 FLEXIBLE
TO VC-117 BOARD CN802
(See Page 101)
CN502
MD BLOCK
M902 CAPSTAN MOTOR
CAP FG

VS-91 BOARD (3/3)
(SS)

no mark : REC/PB mode
( ) : REC mode
( ) : PB mode
* : can not be measured

AU-132 (AUDIO), MA-135 (MIC AMP) SCHEMATIC DIAGRAMS

— Ref. No. AU-132 BOARD: 6000, MA-135 BOARD: 5000 series —


1
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4
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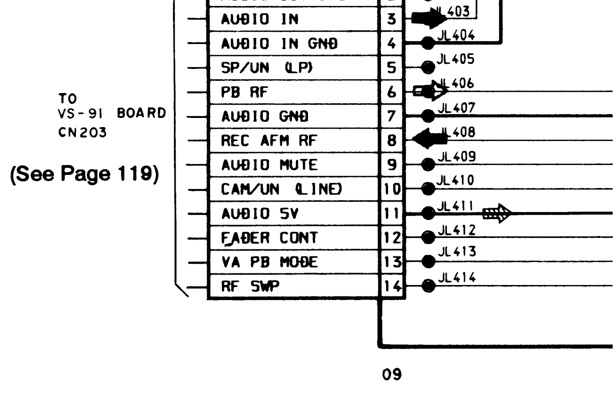
6
7
8
9
10
11
A
B
C
D
E
F
G
H
MICROPHONE UNIT
MIC A
MIC B
CN404
MIC A GND 1
INT MIC A 2
INT MIC B 3
MIC B GND 4
JL452
JL453
C401 1000p B
R401 1500
C403 0.047 B :2125
C402 0.047 B :2125
R402 12k
R403 82k
Q481 2SC4081
(A-6)
3.9
2.1
1.5
C404 100p
R404 100k
R417 3900
R418 0:2125
R419 0:2125
R485 0
R405 8200
C406 0.039 B :2125
R416 330
Q402 MIC +B REG
Q481 FILTER
Q403,404 MIC AMP
Q405 LIPPLE FILTER
J904
MIC PLUG IN POWER
C407 1000p B
(B-6)
D401 MA8082M
(C-7)
R406 6800
Q402 2SC4081
2.8
3.9
2.3
R408 6800
ANA GND
C409 10 10V :BP
0.6
Q403 2SC4081
(B-2)
1.2
0
R409 18k
C416 10p
R411 4700
C410 100p
C411 4.7 6.3V :TA/A
1.7
Q404 2SC4081
(A-8)
1.2
0.6
R410 120
R412 18k
R413 1k
C408 0.1 F
R407 18k
JL455
3.9
(A-7)
Q405 2SC4081
4.7
4.6
R414 3900
R415 10k
C413 47 6.3V :AL #5
C414 1000p B
C415 220p
C412 4.7 6.3V :TA/A
no mark: REC/PB mode
JL454
JL451
W405
3 MIC 5V
2 MIC IN
1 MIC GND
MA-135 BOARD
CHASSIS GND
CN402
MIC 5V 3
MIC IN 2
MIC GND 1
JL421
JL422
C467 1000p B
AU-132 BO

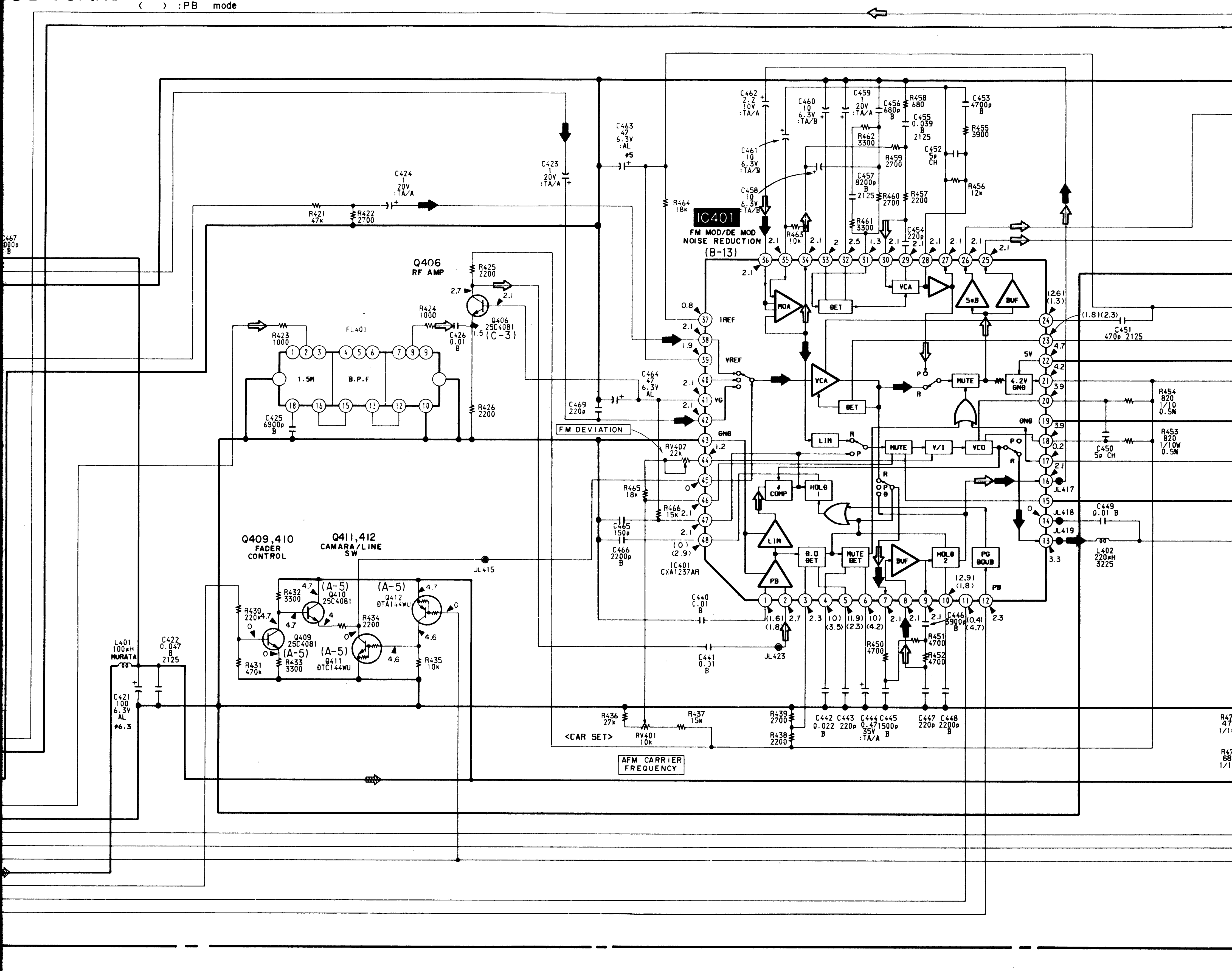
- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				➡
PB				⇨

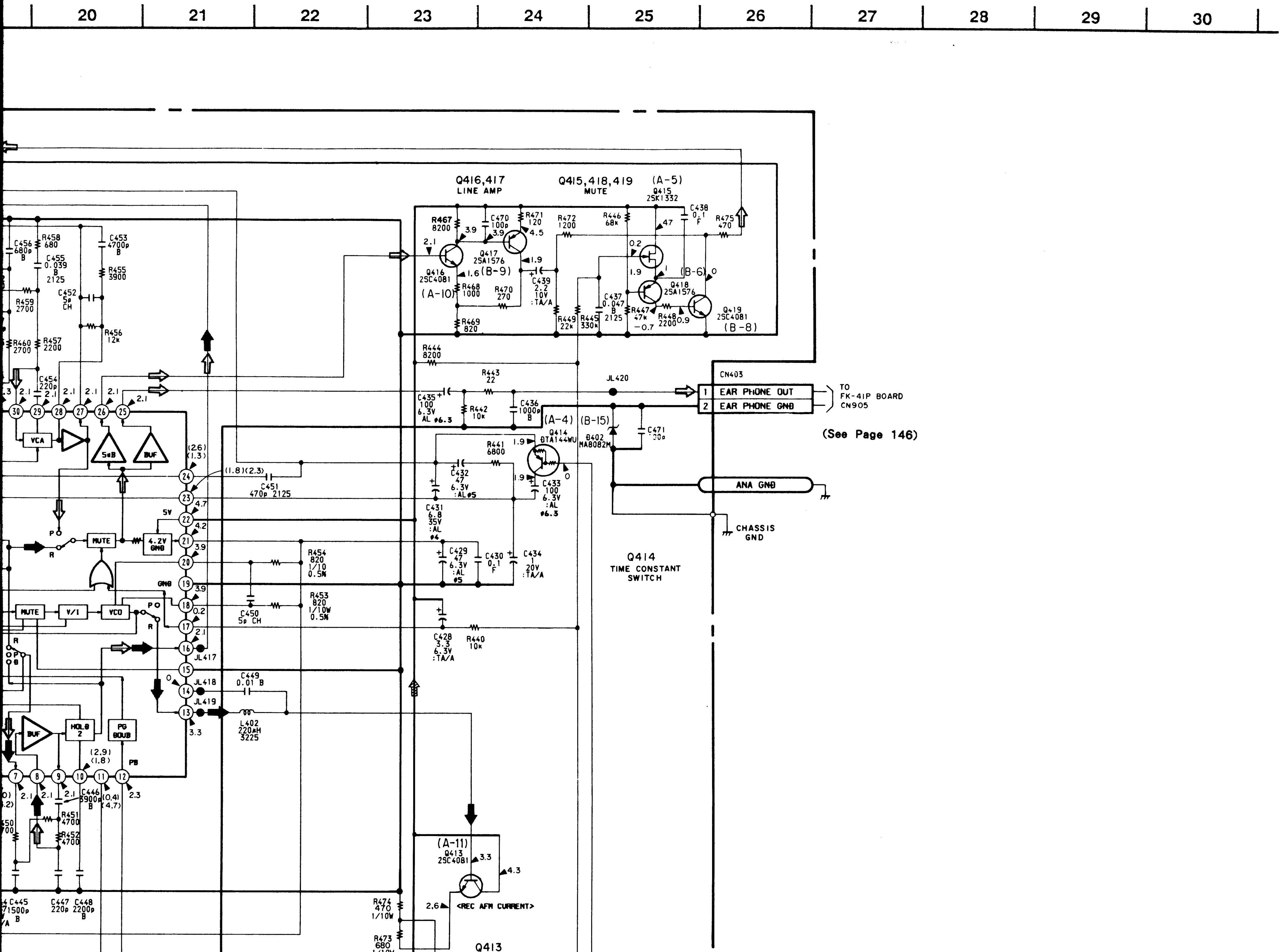

CN401
AUDIO OUT 1
AUDIO OUT GND 2
AUDIO IN 3
AUDIO IN GND 4
SP/UN (LP) 5
PB RF 6
AUDIO GND 7
REC AFM RF 8
AUDIO MUTE 9
CAM/UN (LINE) 10
AUDIO 5V 11
FADER CONT 12
VA PB MODE 13
RF SWP 14
JL401
JL402
JL403
JL404
JL405
JL406
JL407
JL408
JL409
JL410
JL411
JL412
JL413
JL414
TO VS-91 BOARD CN203
(See Page 119)
09

11	12	13	14	15	16	17	18	19	20	21	22

32 BOARD no mark : REC/PB mode
( ) : REC mode
( ) : PB mode



IC401
FM MOD/DE MOD
NOISE REDUCTION
(B-13)
IC401
CXA1237AR
Q406
RF AMP
Q406
2SC4081
(C-3)
FL401
1.5M
B.P.F
Q409,410
FADER
CONTROL
Q411,412
CAMARA/LINE
SW
Q409
2SC4081
Q410
2SC4081
Q411
DTC144WU
Q412
DTA144WU
(A-5)
FM DEVIATION
RV402
22k
<CAR SET>
RV401
10k
AFM CARRIER
FREQUENCY
IREF
VREF
VG
GND
MOA
DET
VCA
5dB
BUF
MUTE
4.2V
GND
LIM
V/I
VCO
φ
COMP
HOLD
1
LIM
PB
D.O
DET
MUTE
DET
BUF
HOLD
2
PG
DOUB
L401
100µH
MURATA
L402
220µH
3225
C421
100
6.3V
AL
C422
0.047
B
2125
C423
1
20V
:TA/A
C424
1
20V
:TA/A
C425
6800p
B
C426
0.01
B
C440
0.01
B
C441
0.01
B
C442
0.022
B
C443
220p
C444
0.47
35V
:TA/A
C445
1500p
B
C447
220p
C448
2200p
B
C446
3900p
B
C449
0.01 B
C450
5p CH
C451
470p 2125
C452
5p
CH
C453
4700p
B
C454
220p
C455
0.039
B
2125
C456
680p
B
C457
8200p
B
2125
C458
10
6.3V
:TA/B
C459
1
20V
:TA/A
C460
10
6.3V
:TA/B
C461
10
6.3V
:TA/B
C462
2.2
10V
:TA/A
C463
47
6.3V
:AL
C464
47
6.3V
AL
C465
150p
C466
2200p
B
C469
220p
R421
47k
R422
2700
R423
1000
R424
1000
R425
2200
R426
2200
R430
220k
R431
470k
R432
3300
R433
3300
R434
2200
R435
10k
R436
27k
R437
15k
R438
2200
R439
2700
R450
4700
R451
4700
R452
4700
R453
820
1/10W
0.5%
R454
820
1/10
0.5%
R455
3900
R456
12k
R457
2200
R458
680
R459
2700
R460
2700
R461
3300
R462
3300
R463
10k
R464
18k
R465
18k
R466
15k
JL415
JL417
JL418
JL419
JL423
P
R
PB
5V


20
21
22
23
24
25
26
27
28
29
30
Q416,417
LINE AMP
Q415,418,419 (A-5)
MUTE
Q415
2SK1332
Q416
2SC4081
(A-10)
Q417
2SA1576
(B-9)
Q418
2SA1576
(B-6)
Q419
2SC4081
(B-8)
R467 8200
C470 100p
R471 120
R472 1200
R446 68k
C438 0.1 F
R475 470
R468 1000
R470 270
C439 2.2 10V :TA/A
C437 0.047 B 2125
R447 47k
R448 2200
R449 22k
R445 330k
R469 820
R444 8200
R443 22
JL420
CN403
1 EAR PHONE OUT
2 EAR PHONE GND
TO
FK-41P BOARD
CN905
(See Page 146)
C435 100 6.3V AL #6.3
R442 10k
C436 1000p B
(A-4)
(B-15)
Q414
DTA144WU
D402
MA8082M
C471 330p
R441 6800
C432 47 6.3V :AL#5
C433 100 6.3V :AL #6.3
C431 6.8 35V :AL #4
ANA GND
CHASSIS GND
C429 47 6.3V :AL #5
C430 0.1 F
C434 1 20V :TA/A
Q414
TIME CONSTANT
SWITCH
C428 3.3 6.3V :TA/A
R440 10k
R454 820 1/10 0.5W
R453 820 1/10W 0.5W
C450 5p CH
C451 470p 2125
C449 0.01 B
L402 220μH 3225
JL417
JL418
JL419
VCA
S+B
BUF
MUTE
4.2V GND
V/I
VCO
HOLD 2
PG DOUB
5V
GND
PB
C456 680p B
R458 680
C455 0.039 B 2125
C453 4700p B
R455 3900
R459 2700
C452 5p CH
R456 12k
R460 2700
R457 2200
C454 220p
C446 3900p B
R451 4700
R452 4700
C445 1500p B
C447 220p
C448 2200p B
(A-11)
Q413
2SC4081
<REC AFM CURRENT>
R474 470 1/10W
R473 680 1/10W
Q413
REC AFM
BUFFER

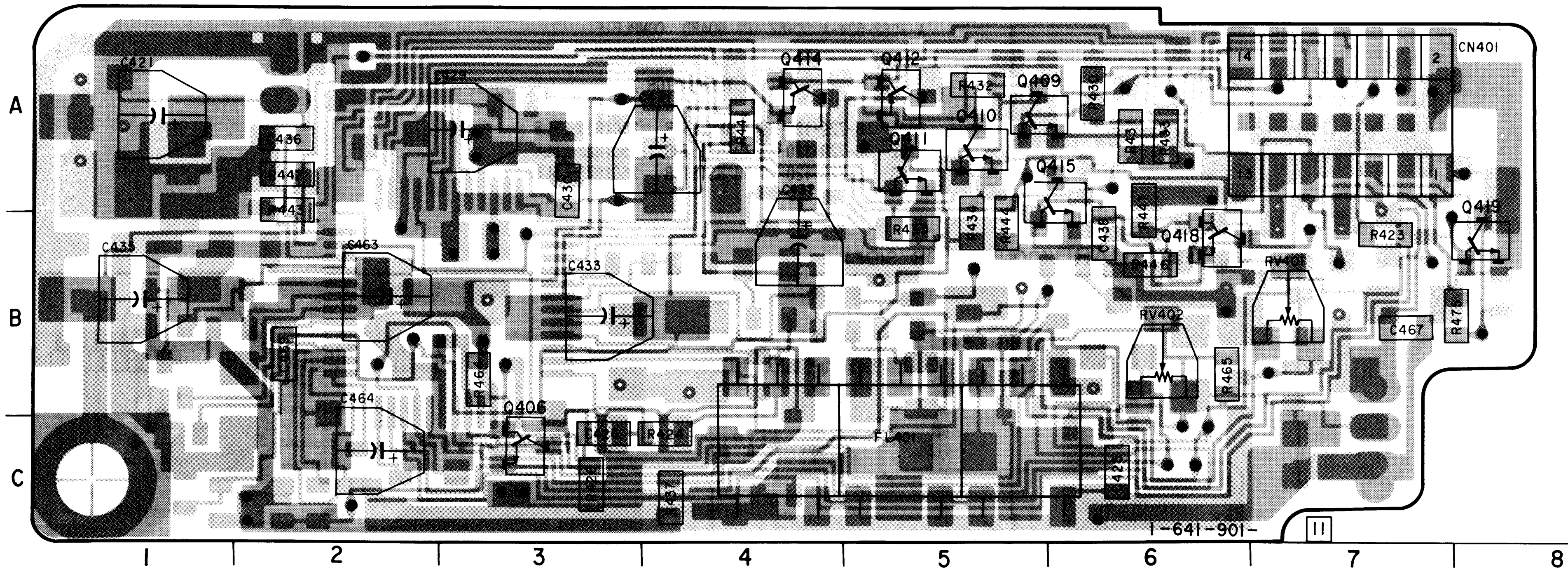
AUDIO AUDIO

AU-132 (AUDIO), MA-135 (MIC AMP) PRINTED WIRING BOARDS

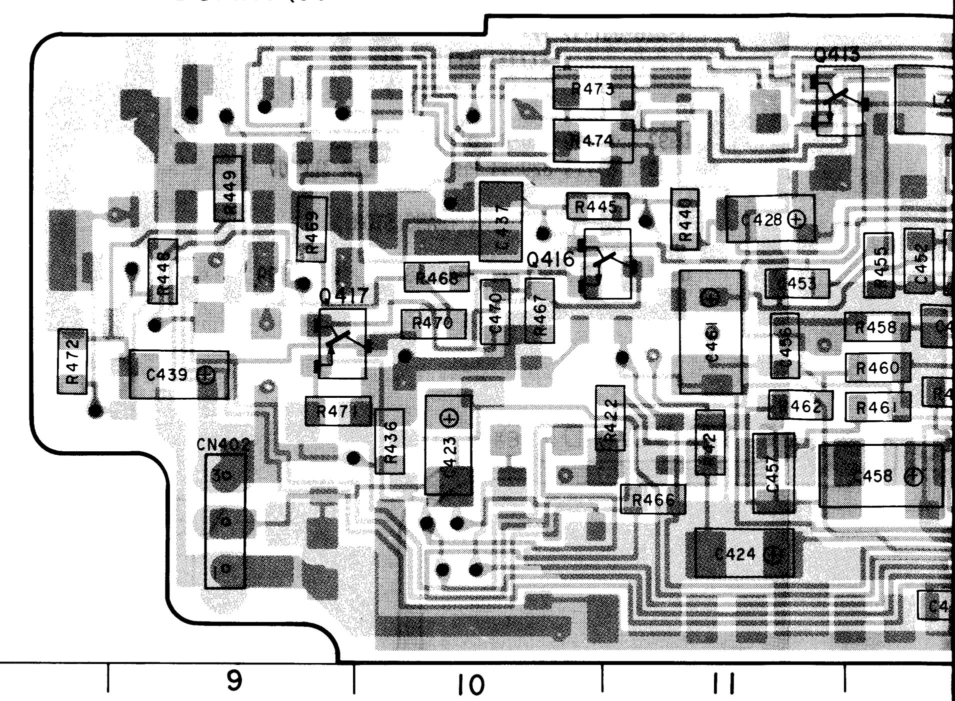
— Ref. No. AU-132 BOARD: 6000, MA-135 BOARD: 5000 series —

- **For printed wiring boards.**
- AU-132, MA-135 boards are the printed wiring board which has four layers structure but inner two layers' patterns are omitted.

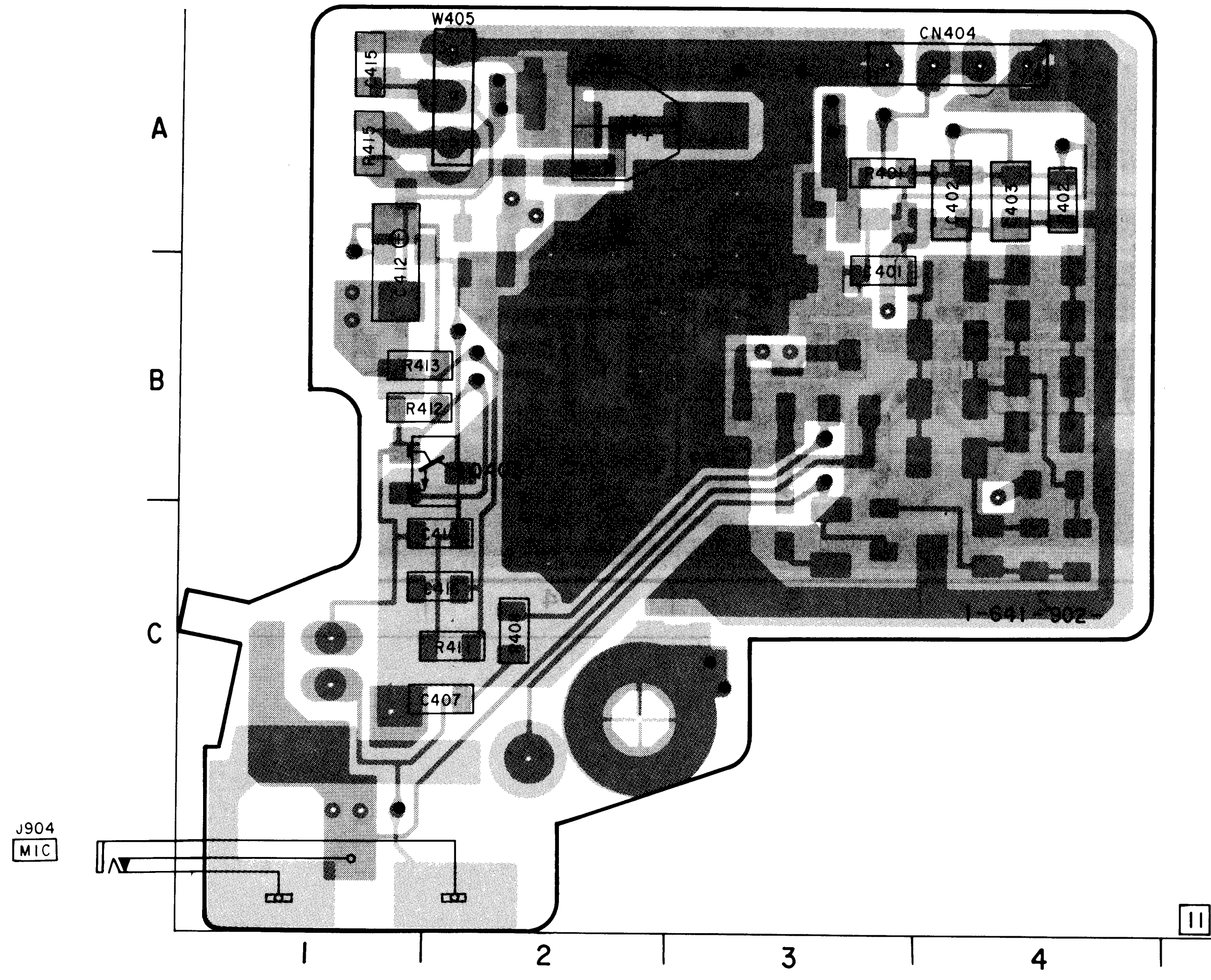
AU-132 BOARD(COMPONENT SIDE)


A
B
C
1
2
3
4
5
6
7
8
CN401
C421
C436
C442
R443
C435
C463
C433
C464
C437
C432
Q414
Q412
Q411
Q410
Q409
Q415
Q418
Q419
Q406
R432
R431
R441
R438
R423
R465
R471
C467
RV401
RV402
FL401
R424
C446
1-641-901-
11

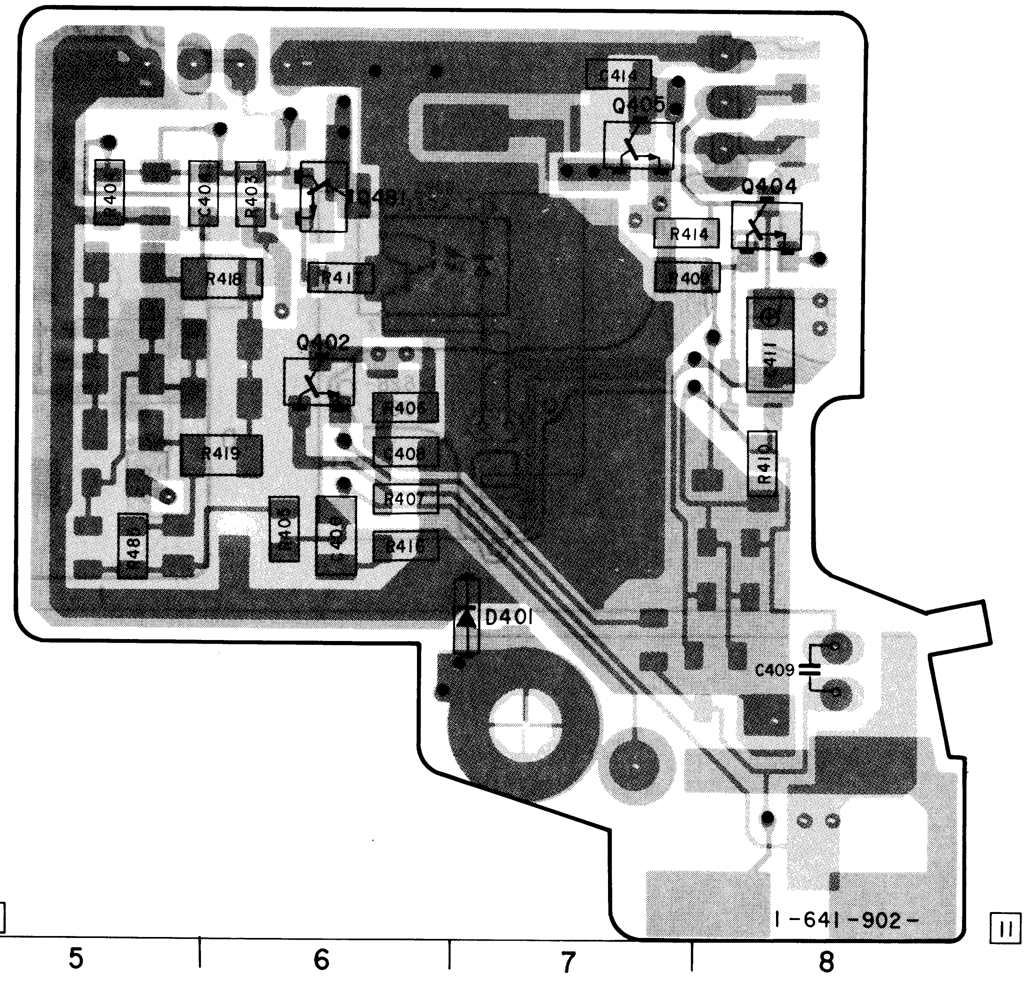
AU-132 BOARD(CONDUCTOR SIDE)


Q413
R473
R474
R449
R445
R448
C428
Q416
Q417
R446
R468
R470
R467
R472
C439
R471
R436
C423
R422
R466
C424
C457
R458
R460
R461
R462
C453
CN402
9
10
11

MA-135 BOARD(COMPONENT SIDE)


W405
CN404
A
B
C
R415
R413
R412
R401
C402
R403
R402
C401
Q403
C407
J904
MIC
1-641-902
1
2
3
4
11

MA-135 BOARD(CONDUCTOR SIDE)


C414
Q405
Q404
Q481
Q402
R414
R416
R417
R419
R411
R410
R406
R407
R418
D401
C409
1-641-902-
11
5
6
7
8

A-7071-536-A MA
**

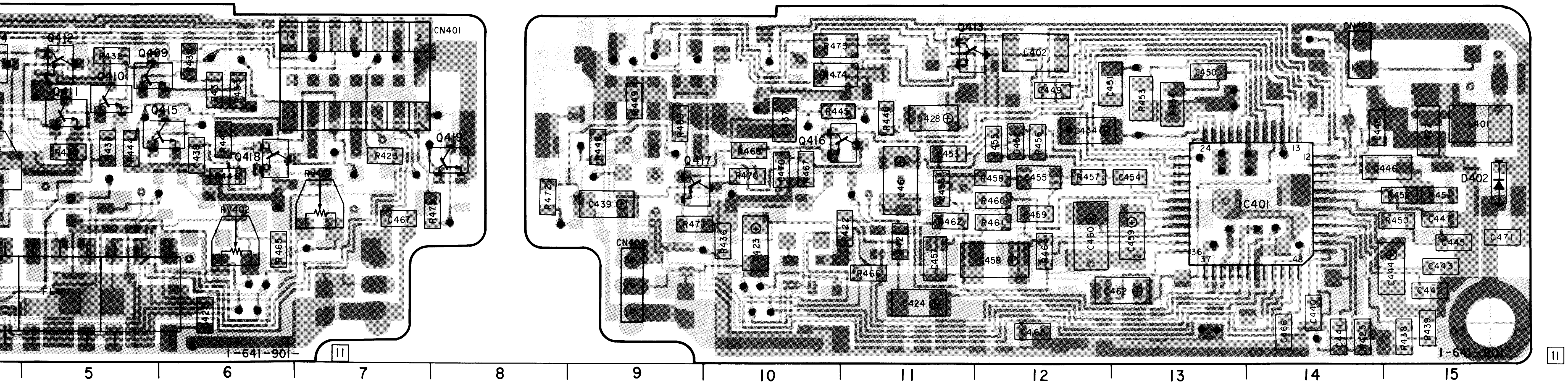
D401 8-719-42

Q402 8-729-12
Q403 8-729-12
Q404 8-729-12
Q405 8-729-12
Q481 8-729-12

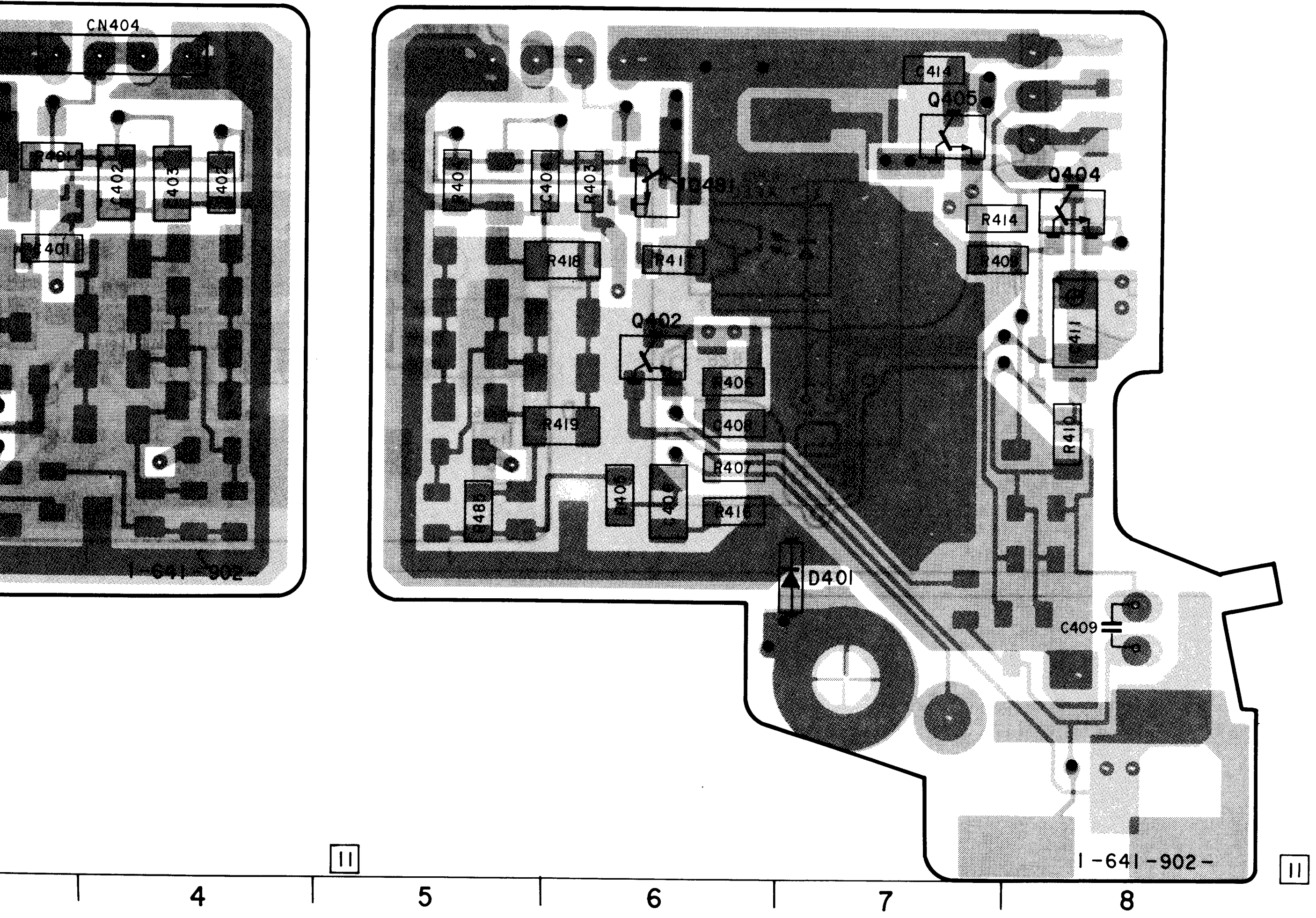
09

ed wiring board which has
ers' patterns are omitted.

AU-132 BOARD (CONDUCTOR SIDE)


CN401
CN402
CN403
Q409
Q410
Q411
Q412
Q413
Q415
Q416
Q417
Q418
Q419
R423
R432
R445
R449
R453
R457
R458
R459
R460
R461
R462
R465
R466
R467
R468
R470
R471
R472
R473
R474
RV401
RV402
L401
L402
C424
C428
C434
C439
C442
C443
C445
C446
C447
C449
C450
C454
C455
C459
C460
C462
C465
C467
C471
IC401
D402
24
13
12
36
37
48
1
1-641-901-
11
5
6
7
8
9
10
11
12
13
14
15

MA-135 BOARD (CONDUCTOR SIDE)


CN404
Q402
Q404
Q405
Q481
R401
R402
R403
R404
R406
R407
R408
R409
R410
R411
R412
R414
R416
R418
R419
C401
C402
C403
C404
C405
C406
C409
C414
D401
1-641-902-
1-641-902-
11
4
5
6
7
8

A-7071-536-A MA-135 BOARD, COMPLETE
****

(DIODE)

D401	8-719-420-15	DIODE	MA8082-M(TX)

(TRANSISTOR)

Q402	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q403	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q404	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q405	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q481	8-729-120-28	TRANSISTOR	2SC1623-L5L6

A-7062-991-A AU-132 BOARD, COMPLETE
****

(DIODE)

D402	8-719-420-15	DIODE	MA8082-M(TX)

(IC)

IC401	8-752-033-01	IC	CXA1237AR

(TRANSISTOR)

Q406	8-729-117-32	TRANSISTOR	2SC4177
Q409	8-729-117-32	TRANSISTOR	2SC4177
Q410	8-729-117-32	TRANSISTOR	2SC4177
Q411	8-729-905-15	TRANSISTOR	DTC144WU
Q412	8-729-905-09	TRANSISTOR	DTA144WU
Q413	8-729-117-32	TRANSISTOR	2SC4177
Q414	8-729-905-09	TRANSISTOR	DTA144WU
Q415	8-729-142-91	TRANSISTOR	2SK853-T1K5
Q416	8-729-117-32	TRANSISTOR	2SC4177
Q417	8-729-420-24	TRANSISTOR	2SB1218A-QRS
Q418	8-729-420-24	TRANSISTOR	2SB1218A-QRS
Q419	8-729-117-32	TRANSISTOR	2SC4177

CC-52P (CHROMA NOISE REDUCTION, MECHA DECK LINK), FP-89 (TAPE SENSOR), FP-90 (TAPE SENSOR) PRINTED WIRING BOARDS

— Ref. No. CC-52P BOARD: 7000, FP-89 BOARD: 11000, FP-90 BOARD: 12000 series —

1-628-060-12 FP-89 FLEXIBLE BOARD
****

(DIODE)

D991	8-719-820-44	PHOTO COUPLER TLP907

(TRANSISTOR)

Q991	8-729-906-48	TRANSISTOR EE-TP109

1-628-061-12 FP-90 FLEXIBLE BOARD
****

(DIODE)

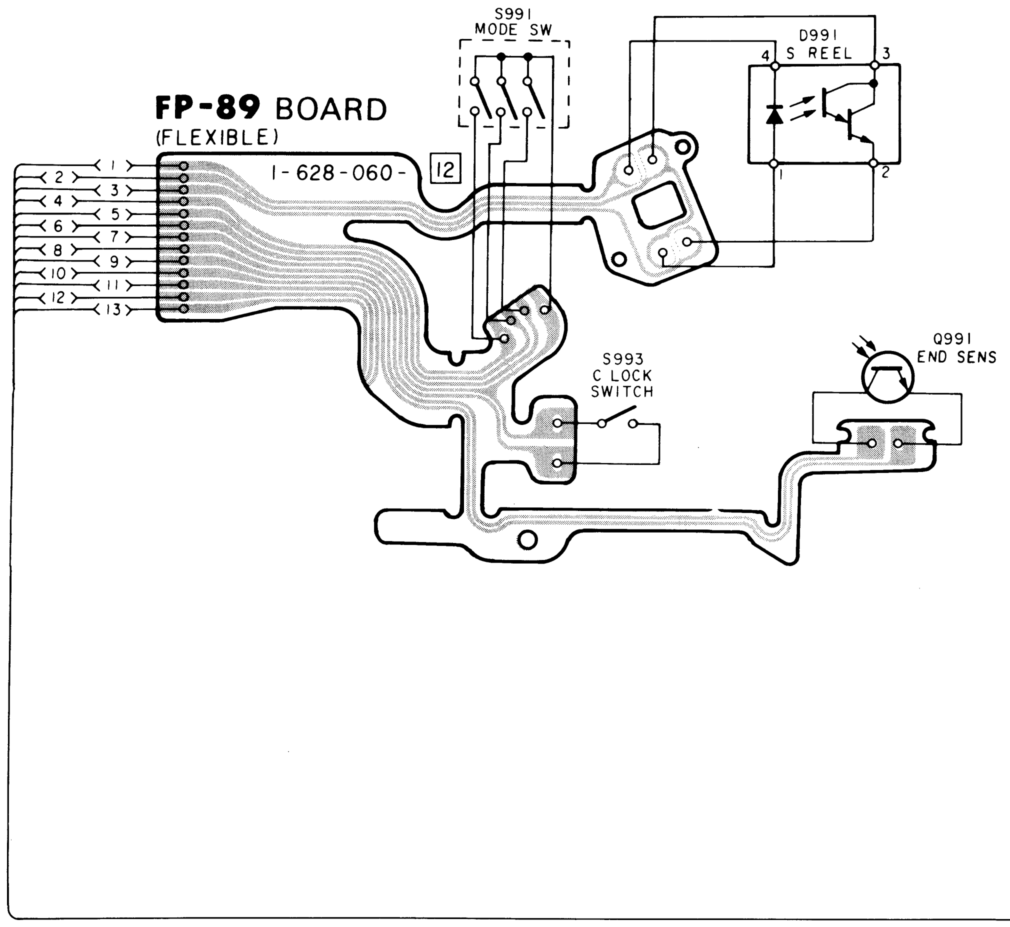
D992	8-719-940-81	DIODE GL452S
D993	8-719-820-44	PHOTO COUPLER TLP907

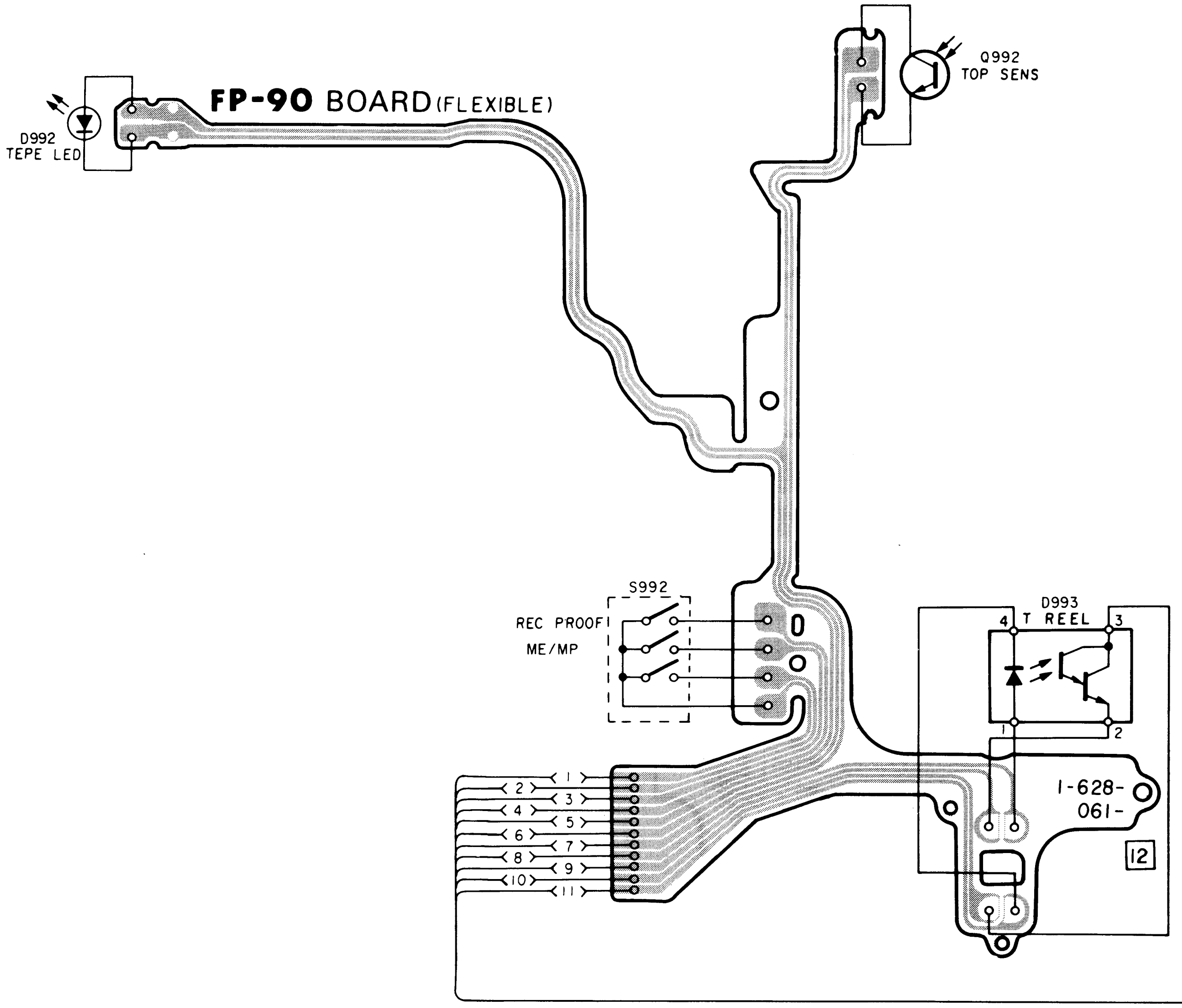
(TRANSISTOR)

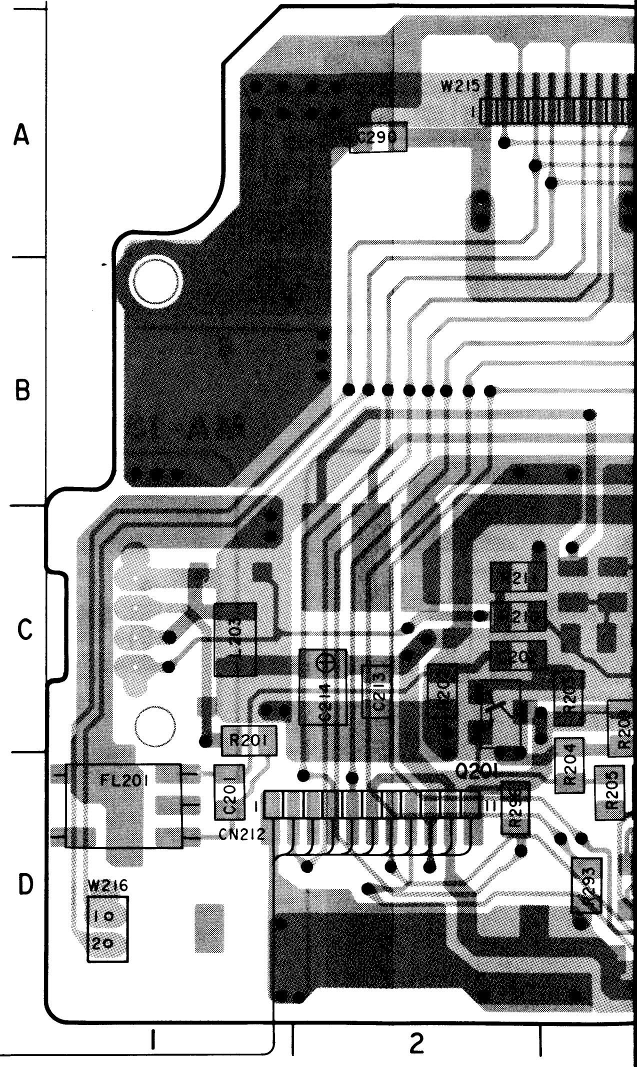
Q992	8-729-906-48	TRANSISTOR EE-TP109

A-7062-624-A

Q201	8-729-
Q202	8-729-
Q203	8-729-


FP-89 BOARD
(FLEXIBLE)
1-628-060-
12
S991
MODE SW
D991
S REEL
4
3
1
2
S993
C LOCK
SWITCH
Q991
END SENS
1
2
3
4
5
6
7
8
9
10
11
12
13
09


FP-90 BOARD(FLEXIBLE)
D992
TEPE LED
Q992
TOP SENS
S992
REC PROOF
ME/MP
D993
T REEL
4
3
1
2
1-628-
061-
12
1
2
3
4
5
6
7
8
9
10
11


CC-52PBOARD (CONDUCTOR SIDE)
A
B
C
D
1
2
W215
Q290
R201
FL201
C201
CN212
Q201
R204
R205
C213
W216
10
20

PE SENSOR) PRINTED WIRING BOARDS

1-628-061-12 FP-90 FLEXIBLE BOARD
****

(DIODE)

D992	8-719-940-81	DIODE	GL452S
D993	8-719-820-44	PHOTO COUPLER	TLP907

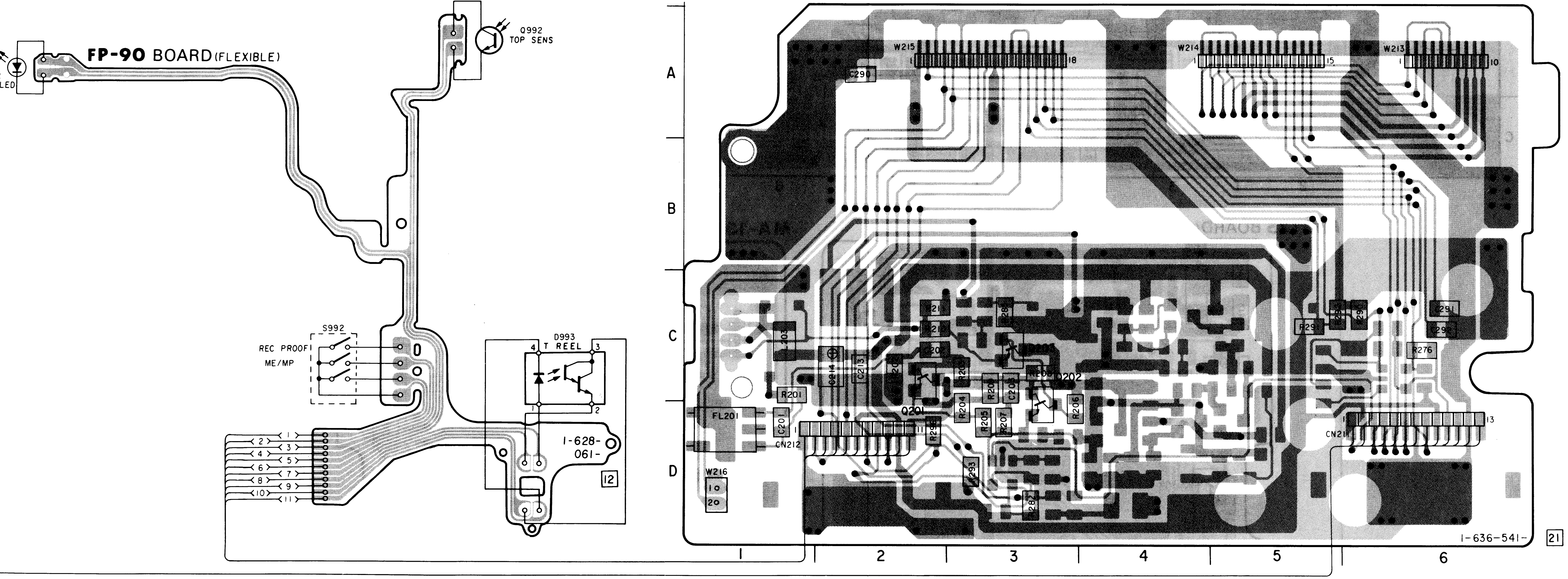
(TRANSISTOR)

Q992	8-729-906-48	TRANSISTOR	EE-TP109

A-7062-624-A CC-52 (P) BOARD, COMPLETE
****

(TRANSISTOR)

Q201	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q202	8-729-120-28	TRANSISTOR	2SC1623-L5L6
Q203	8-729-120-28	TRANSISTOR	2SC1623-L5L6



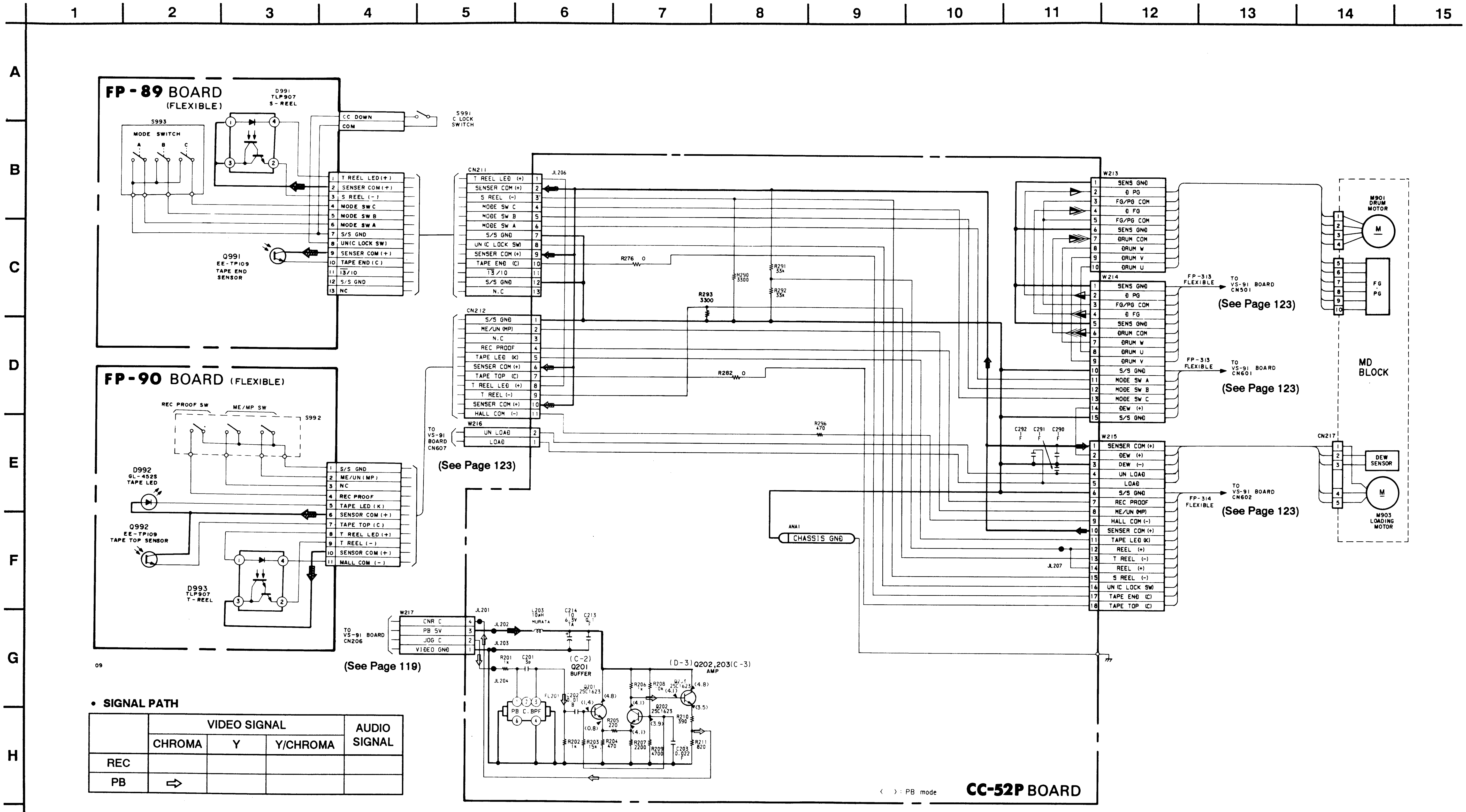
FP-90 BOARD (FLEXIBLE)

CC-52P BOARD (CONDUCTOR SIDE)

LED
Q992
TOP SENS
S992
REC PROOF
ME/MP
D993
T REEL
4
3
1
2
1-628-061-
12
1
2
3
4
5
6
7
8
9
10
11
A
B
C
D
W215
1
18
W214
15
W213
10
C290
R211
R210
R202
R203
R209
R201
C203
C214
C213
Q201
Q202
Q203
R204
R205
R206
R207
R208
C201
C206
R293
R292
R291
C291
C292
R276
FL201
CN212
CN211
13
W216
10
20
1-636-541-
21
1
2
3
4
5
6

CC-52P (CHROMA NOISE REDUCTION, MECHA DECK LINK), FP-89 (TAPE SENSOR), FP-90 (TAPE SENSOR) SCHEMATIC DIAGRAMS

— Ref. No. CC-52P BOARD: 7000, FP-89 BOARD: 11000, FP-90 BOARD: 12000 series —


1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
FP-89 BOARD (FLEXIBLE)
D991 TLP907 S-REEL
S993 MODE SWITCH
A
B
C
CC DOWN
COM
S991 C LOCK SWITCH
1 T REEL LED (+)
2 SENSER COM (+)
3 S REEL (-)
4 MODE SW C
5 MODE SW B
6 MODE SW A
7 S/S GND
8 UN (C LOCK SW)
9 SENSER COM (+)
10 TAPE END (C)
11 13/10
12 S/S GND
13 NC
Q991 EE-TP109 TAPE END SENSOR
FP-90 BOARD (FLEXIBLE)
REC PROOF SW
ME/MP SW
S992
D992 GL-452S TAPE LED
Q992 EE-TP109 TAPE TOP SENSOR
D993 TLP907 T-REEL
1 S/S GND
2 ME/UN (MP)
3 NC
4 REC PROOF
5 TAPE LED (K)
6 SENSOR COM (+)
7 TAPE TOP (C)
8 T REEL LED (+)
9 T REEL (-)
10 SENSOR COM (+)
11 MALL COM (-)
09
CN211
T REEL LED (+) 1
SENSER COM (+) 2
S REEL (-) 3
MODE SW C 4
MODE SW B 5
MODE SW A 6
S/S GND 7
UN (C LOCK SW) 8
SENSER COM (+) 9
TAPE END (C) 10
13/10 11
S/S GND 12
N.C 13
JL206
CN212
S/S GND 1
ME/UN (MP) 2
N.C 3
REC PROOF 4
TAPE LED (K) 5
SENSER COM (+) 6
TAPE TOP (C) 7
T REEL LED (+) 8
T REEL (-) 9
SENSER COM (+) 10
HALL COM (-) 11
W216
UN LOAD 2
LOAD 1
TO VS-91 BOARD CN607
(See Page 123)
R276 0
R290 3300
R291 33k
R292 33k
R293 3300
R282 0
R296 470
ANA1
CHASSIS GND
W213
1 SENS GND
2 θ PG
3 FG/PG COM
4 θ FG
5 FG/PG COM
6 SENS GND
7 DRUM COM
8 DRUM W
9 DRUM V
10 DRUM U
W214
1 SENS GND
2 θ PG
3 FG/PG COM
4 θ FG
5 SENS GND
6 DRUM COM
7 DRUM W
8 DRUM U
9 DRUM V
10 S/S GND
11 MODE SW A
12 MODE SW B
13 MODE SW C
14 DEW (+)
15 S/S GND
FP-313 FLEXIBLE
TO VS-91 BOARD CN501
(See Page 123)
FP-313 FLEXIBLE
TO VS-91 BOARD CN601
(See Page 123)
C292 F
C291 F
C290 F
W215
1 SENSER COM (+)
2 DEW (+)
3 DEW (-)
4 UN LOAD
5 LOAD
6 S/S GND
7 REC PROOF
8 ME/UN (MP)
9 HALL COM (-)
10 SENSER COM (+)
11 TAPE LED (K)
12 REEL (+)
13 T REEL (-)
14 REEL (+)
15 S REEL (-)
16 UN (C LOCK SW)
17 TAPE END (C)
18 TAPE TOP (C)
JL207
FP-314 FLEXIBLE
TO VS-91 BOARD CN602
(See Page 123)
M901 DRUM MOTOR
M
FG · PG
MD BLOCK
CN217
DEW SENSOR
M903 LOADING MOTOR
W217
CNR C 4
PB 5V 3
JOG C 2
VIDEO GND 1
TO VS-91 BOARD CN206
(See Page 119)
JL201
JL202
JL203
JL204
L203 10μH MURATA
C214 10 6.3V TA
C213 0.1 F
R201 1k
C201 3p
(C-2) Q201 BUFFER
(D-3) Q202,203 (C-3) AMP
PB C.BPF
FL201
C202 0.01 B
Q201 2SC1623
Q202 2SC1623
Q203 2SC1623
(1.4)
(4.8)
(0.8)
(4.1)
(4.1)
(3.9)
(4.1)
(4.8)
(3.5)
R202 1k
R203 15k
R204 470
R205 220
R206 1k
R207 2200
R208 10k
R209 4700
R210 390
R211 820
C203 0.022 F
( ) : PB mode
CC-52P BOARD

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC				
PB	⇨			

RM-57P (REMOTE CONTROL RECEIVER) PRINTED WIRING BOARD

— Ref. No. RM-57P BOARD: 13000 series —

A-7063-119-A RM-57P BOARD, COMPLETE
****

(DIODE)

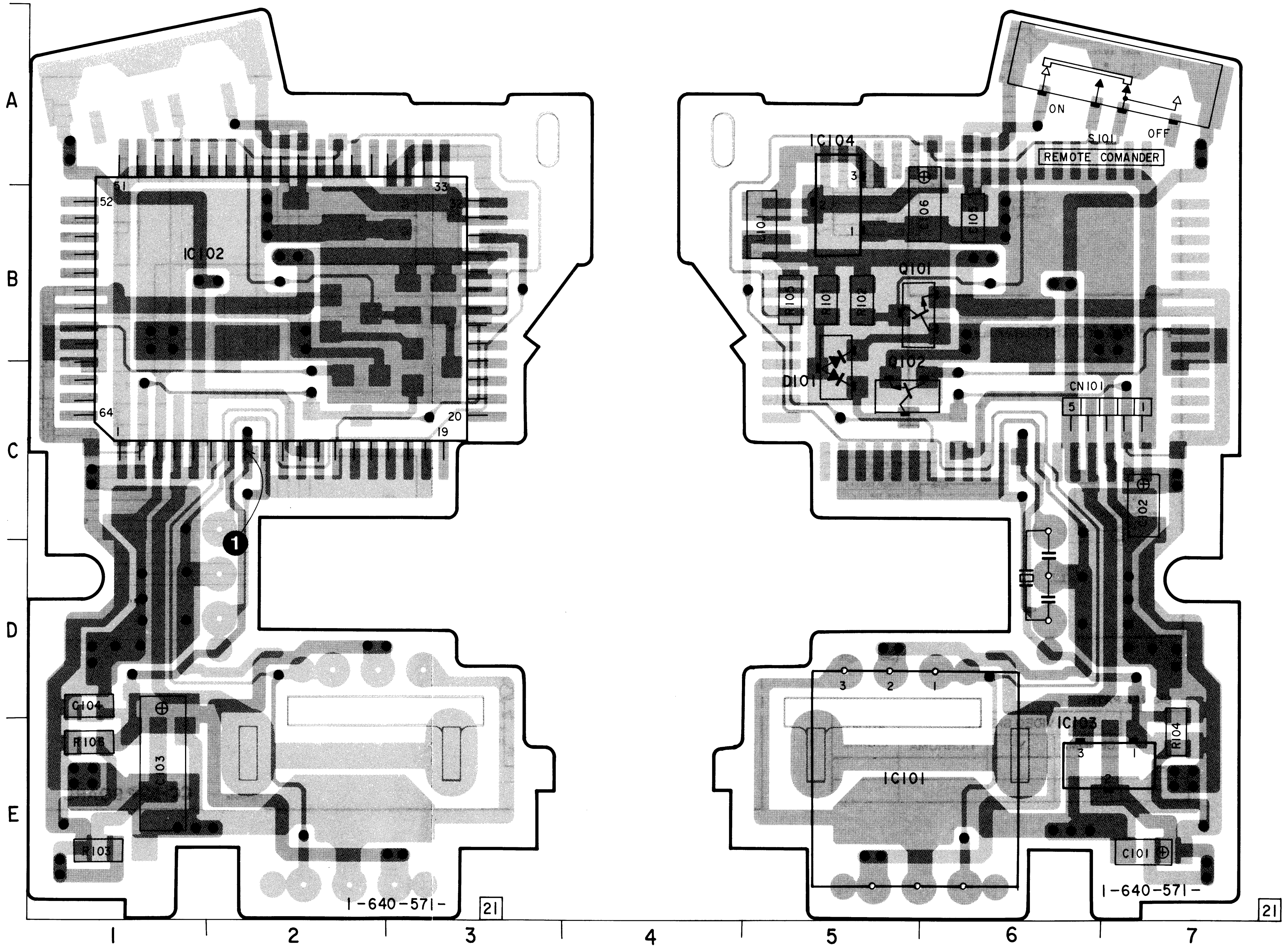
D101	8-719-104-34	DIODE	1S2836

(IC)

IC101	8-741-100-63	IC	SBX1619-51
IC102	8-759-043-91	IC	uPD75104GF-784-3BE
IC103	8-759-946-03	IC	S-8054ALR-LN-S
IC104	8-759-937-54	IC	S-81250HG-RD-S

(TRANSISTOR)

Q101	8-729-901-01	TRANSISTOR	DTC144EK
Q102	8-729-901-01	TRANSISTOR	DTC144EK

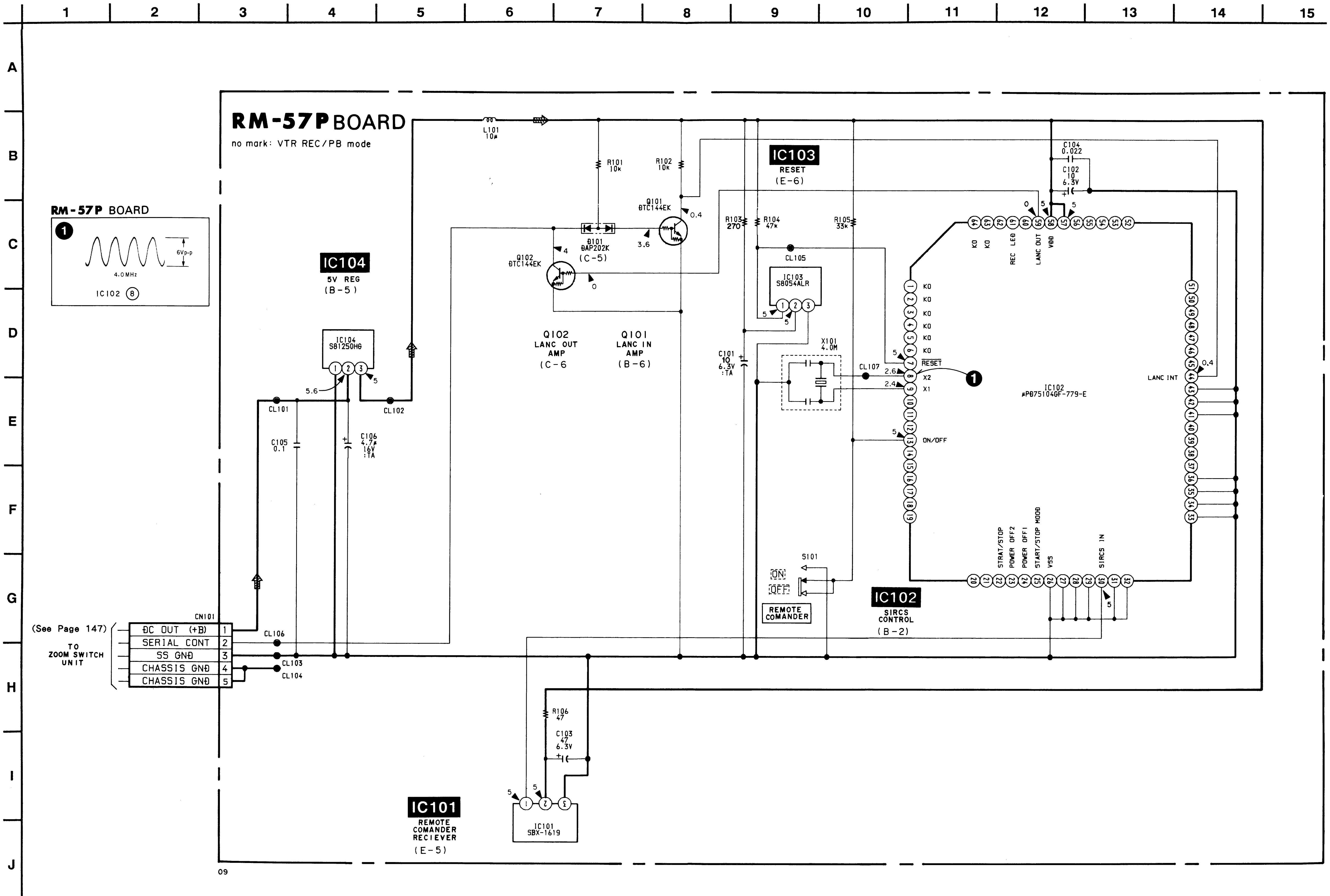

RM-57P BOARD (COMPONENT SIDE)

RM-57P BOARD (CONDUCTOR SIDE)

A
B
C
D
E
1
2
3
4
5
6
7
IC102
51
52
33
32
64
1
20
19
1
C104
R108
R103
IC103
1-640-571-
21
IC104
3
1
Q101
Q102
D101
CN101
5
1
S101
ON
OFF
REMOTE COMANDER
IC101
3
2
1
IC103
3
1
R104
C102
C101
1-640-571-
21

RM-57P (REMOTE CONTROL RECEIVER) SCHEMATIC DIAGRAM

— Ref. No. RM-57P BOARD: 13000 series —

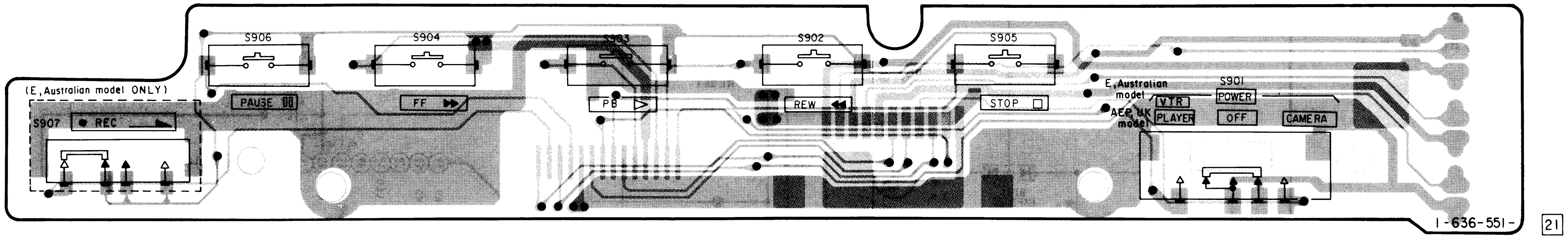

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
RM-57P BOARD
no mark: VTR REC/PB mode
RM-57P BOARD
1
6Vp-p
4.0MHz
IC102 ⑧
IC104
5V REG
(B-5)
IC104
S81250HG
5.6
5
CL101
CL102
C105
0.1
C106
4.7μ
16V
:TA
L101
10μ
R101
10k
R102
10k
Q101
DTC144EK
0.4
D101
DAP202K
(C-5)
3.6
Q102
DTC144EK
4
0
Q102
LANC OUT
AMP
(C-6
Q101
LANC IN
AMP
(B-6)
IC103
RESET
(E-6)
R103
270
R104
47k
R105
33k
CL105
IC103
S8054ALR
5
5
C101
10
6.3V
:TA
X101
4.0M
CL107
2.6
2.4
5
5
C104
0.022
C102
10
6.3V
0
5
5
KO
KO
REC LED
LANC OUT
VDD
KO
KO
KO
KO
KO
KO
RESET
X2
X1
ON/OFF
1
IC102
μPD75104GF-779-E
LANC INT
0.4
STRAT/STOP
POWER OFF2
POWER OFF1
START/STOP MODE
VSS
SIRCS IN
5
S101
ON
OFF
REMOTE
COMANDER
IC102
SIRCS
CONTROL
(B-2)
CN101
(See Page 147)
TO
ZOOM SWITCH
UNIT
DC OUT (+B) 1
SERIAL CONT 2
SS GND 3
CHASSIS GND 4
CHASSIS GND 5
CL106
CL103
CL104
R106
47
C103
47
6.3V
5
5
IC101
SBX-1619
IC101
REMOTE
COMANDER
RECIEVER
(E-5)
09

FK-41P (VTR FUNCTION SWITCH), SW-158P (CAMERA FUNCTION SWITCH), EJ-20P (EJECT SWITCH) PRINTED WIRING BOARDS

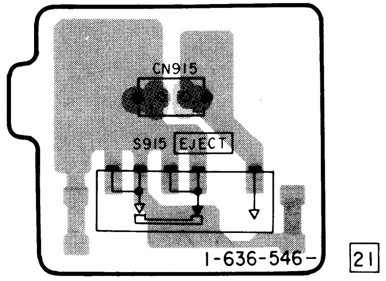
— Ref. No. FK-41P BOARD: 9000, SW-158P BOARD: 5000, EJ-20P BOARD: 1000 series —

- **For printed wiring boards.**
- ZOOM SWITCH UNIT is the printed wiring board which has four layers structure but inner two layers' patterns are omitted.

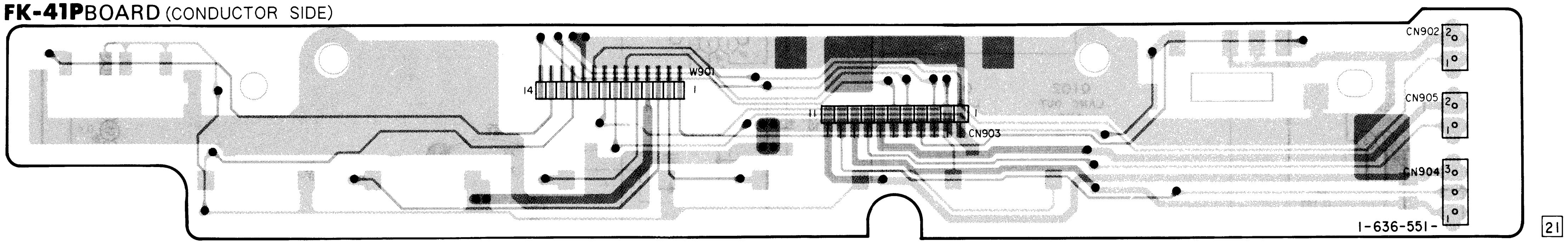
FK-41P BOARD (COMPONENT SIDE)


S906
S904
S903
S902
S905
(E, Australian model ONLY)
S907
● REC
PAUSE
FF
PB
REW
STOP
E, Australian model
AEP, UK model
S901
VTR
POWER
PLAYER
OFF
CAMERA
1-636-551-
21

EJ-20P BOARD (COMPONENT SIDE)


CN915
S915
EJECT
1-636-546-
21

FK-41P BOARD (CONDUCTOR SIDE)

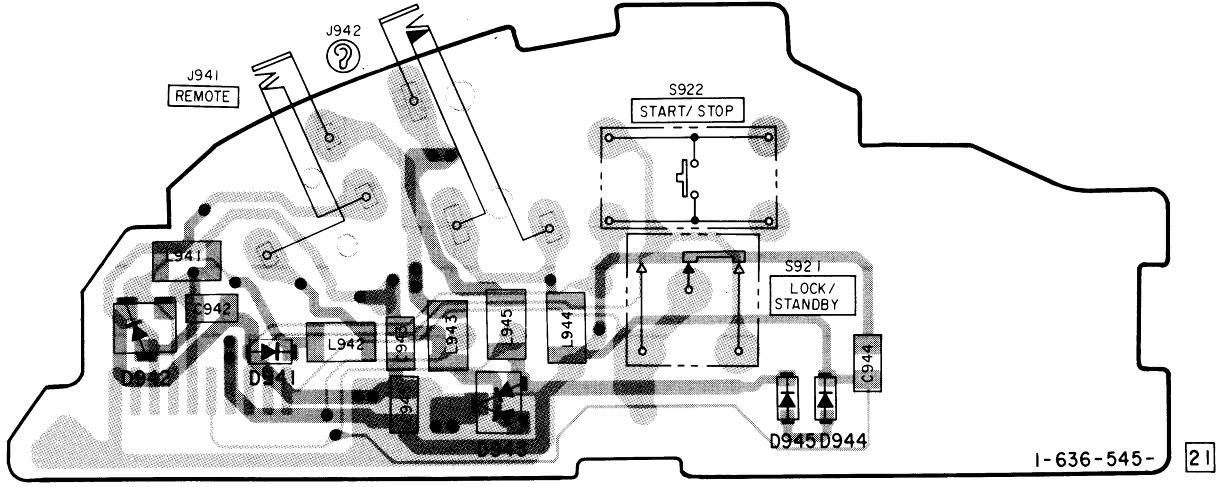

W901
14
1
11
1
CN903
CN902
CN905
CN904
2
1
2
1
3
1-636-551-
21

A-7071-362-A SW-158 (P) BOARD, COMPLETE
****

(DIODE)

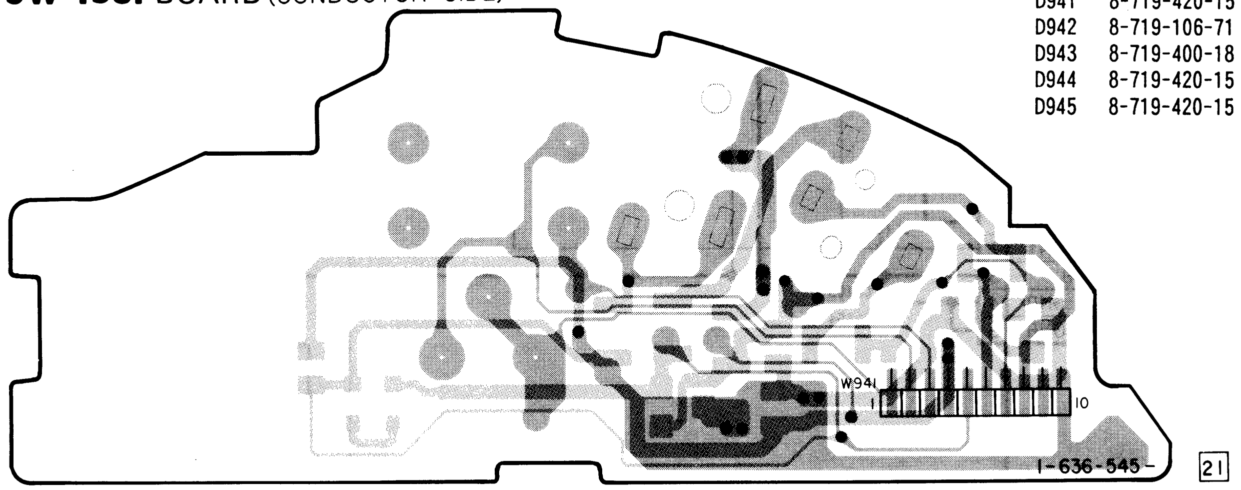
D941	8-719-420-15	DIODE	MA8082-M(TX)
D942	8-719-106-71	DIODE	RD12M-B2
D943	8-719-400-18	DIODE	MA152WK
D944	8-719-420-15	DIODE	MA8082-M(TX)
D945	8-719-420-15	DIODE	MA8082-M(TX)

SW-158P BOARD (COMPONENT SIDE)


J942
J941
REMOTE
S922
START/ STOP
S921
LOCK/ STANDBY
C941
C942
D942
D941
L942
L943
L945
L944
C944
D943
D945
D944
1-636-545-
21

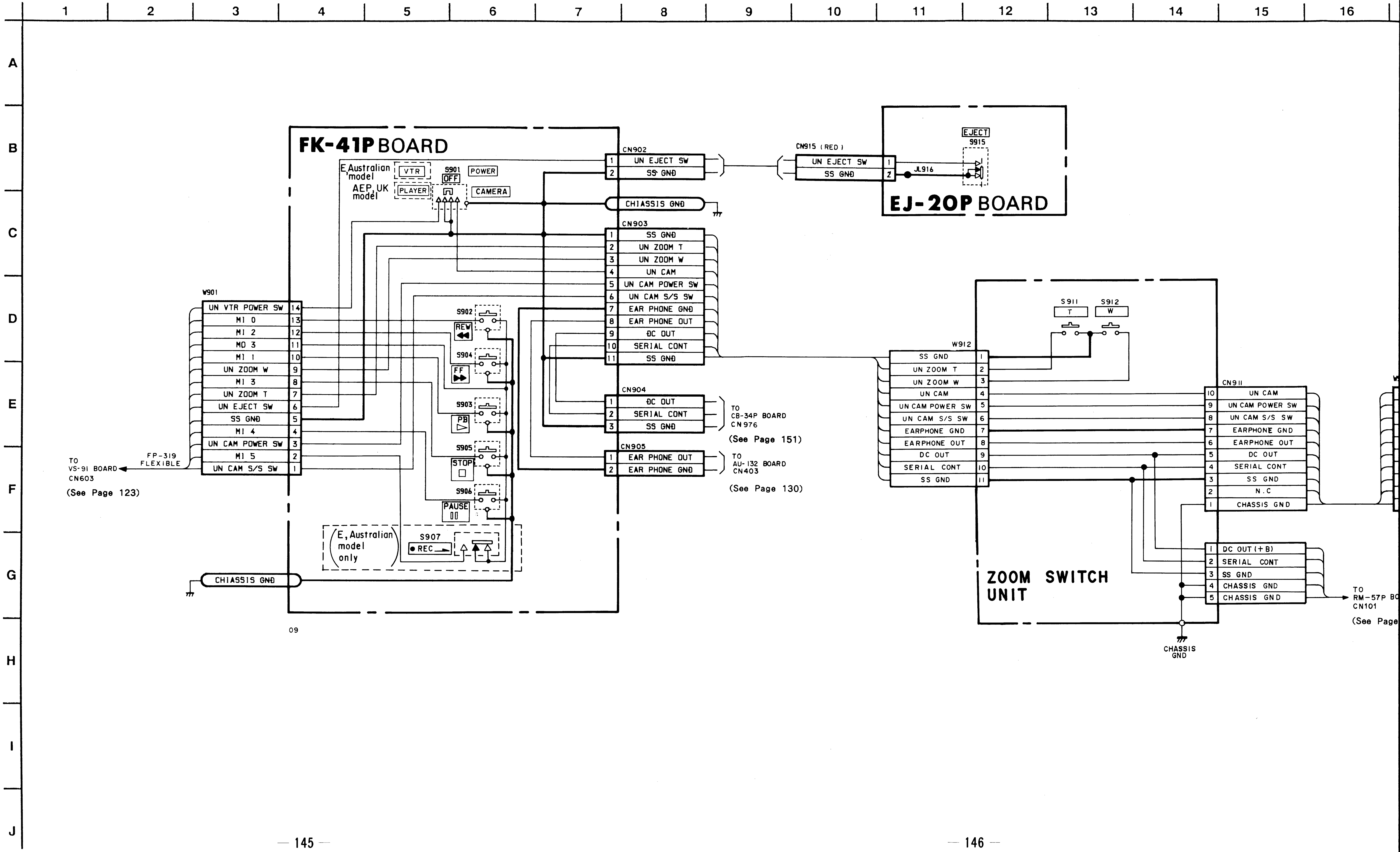
09

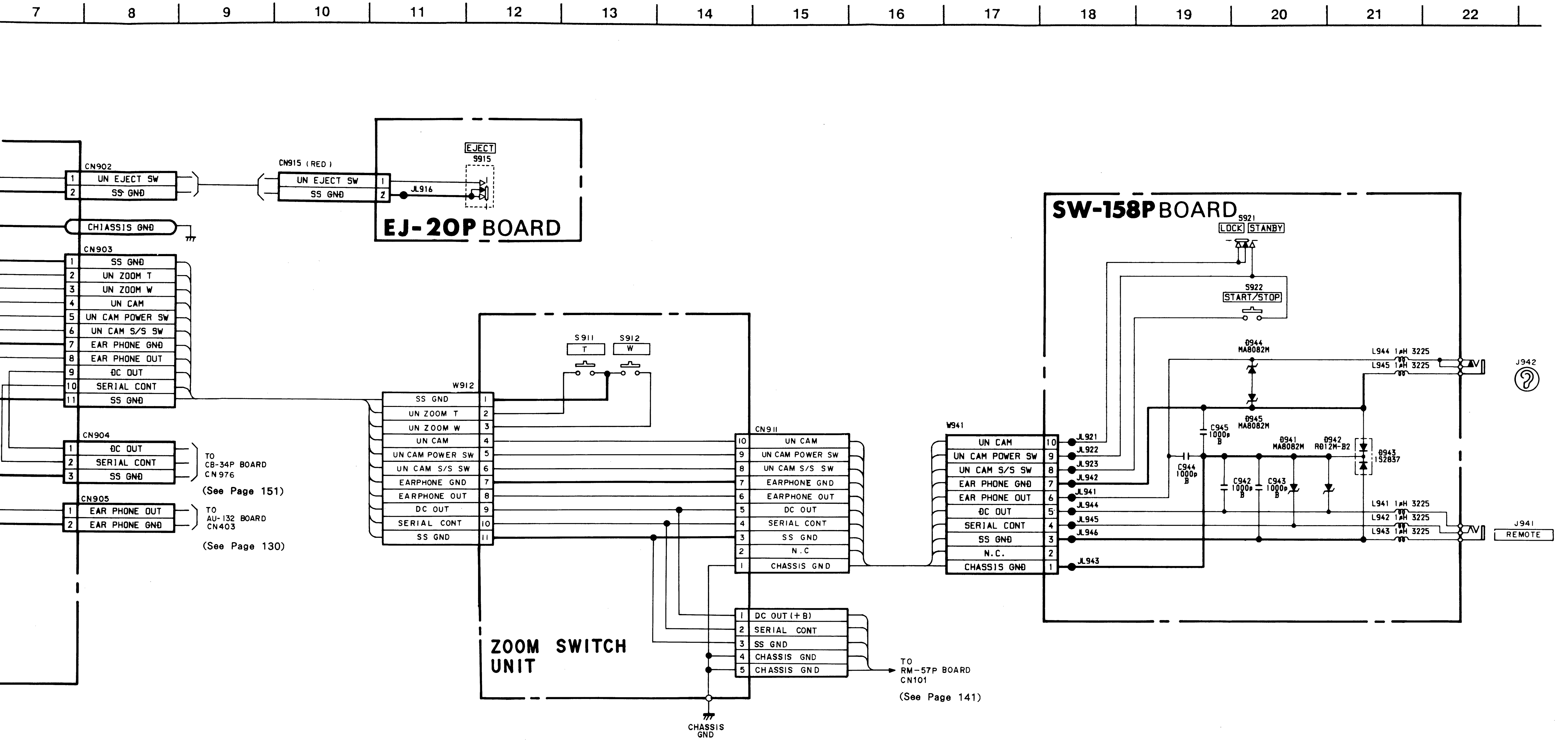
SW-158P BOARD (CONDUCTOR SIDE)


W941
1
10
1-636-545-
21

FK-41P (VTR FUNCTION SWITCH), SW-158P (CAMERA FUNCTION SWITCH), EJ-20P (EJECT SWITCH) ZOOM SWITCH UNIT SCHEMATIC DIAGRAMS

— Ref. No. FK-41P BOARD: 9000, SW-158P BOARD: 5000, EJ-20P BOARD: 1000 series —


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
A B C D E F G H I J
FK-41P BOARD
E,Australian model
AEP,UK model
VTR
PLAYER
S901 OFF
POWER
CAMERA
W901
UN VTR POWER SW 14
MI 0 13
MI 2 12
MO 3 11
MI 1 10
UN ZOOM W 9
MI 3 8
UN ZOOM T 7
UN EJECT SW 6
SS GND 5
MI 4 4
UN CAM POWER SW 3
MI 5 2
UN CAM S/S SW 1
TO VS-91 BOARD CN603
(See Page 123)
FP-319 FLEXIBLE
S902 REW
S904 FF
S903 PB
S905 STOP
S906 PAUSE
E,Australian model only
S907 REC
CHIASSIS GND
09
CN902
1 UN EJECT SW
2 SS GND
CHIASSIS GND
CN903
1 SS GND
2 UN ZOOM T
3 UN ZOOM W
4 UN CAM
5 UN CAM POWER SW
6 UN CAM S/S SW
7 EAR PHONE GND
8 EAR PHONE OUT
9 DC OUT
10 SERIAL CONT
11 SS GND
CN904
1 DC OUT
2 SERIAL CONT
3 SS GND
TO CB-34P BOARD CN976
(See Page 151)
CN905
1 EAR PHONE OUT
2 EAR PHONE GND
TO AU-132 BOARD CN403
(See Page 130)
CN915 (RED)
UN EJECT SW 1
SS GND 2
JL916
EJECT S915
EJ-20P BOARD
S911 T
S912 W
W912
SS GND 1
UN ZOOM T 2
UN ZOOM W 3
UN CAM 4
UN CAM POWER SW 5
UN CAM S/S SW 6
EARPHONE GND 7
EARPHONE OUT 8
DC OUT 9
SERIAL CONT 10
SS GND 11
CN911
10 UN CAM
9 UN CAM POWER SW
8 UN CAM S/S SW
7 EARPHONE GND
6 EARPHONE OUT
5 DC OUT
4 SERIAL CONT
3 SS GND
2 N.C
1 CHASSIS GND
1 DC OUT (+B)
2 SERIAL CONT
3 SS GND
4 CHASSIS GND
5 CHASSIS GND
ZOOM SWITCH UNIT
CHASSIS GND
TO RM-57P B
CN101
(See Page


7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
CN902
1 UN EJECT SW
2 SS GND
CHIASSIS GND
CN903
1 SS GND
2 UN ZOOM T
3 UN ZOOM W
4 UN CAM
5 UN CAM POWER SW
6 UN CAM S/S SW
7 EAR PHONE GND
8 EAR PHONE OUT
9 DC OUT
10 SERIAL CONT
11 SS GND
CN904
1 DC OUT
2 SERIAL CONT
3 SS GND
TO CB-34P BOARD CN976
(See Page 151)
CN905
1 EAR PHONE OUT
2 EAR PHONE GND
TO AU-132 BOARD CN403
(See Page 130)
CN915 (RED)
UN EJECT SW 1
SS GND 2
JL916
EJECT
S915
EJ-20P BOARD
W912
SS GND 1
UN ZOOM T 2
UN ZOOM W 3
UN CAM 4
UN CAM POWER SW 5
UN CAM S/S SW 6
EARPHONE GND 7
EARPHONE OUT 8
DC OUT 9
SERIAL CONT 10
SS GND 11
S911
T
S912
W
CN911
10 UN CAM
9 UN CAM POWER SW
8 UN CAM S/S SW
7 EARPHONE GND
6 EARPHONE OUT
5 DC OUT
4 SERIAL CONT
3 SS GND
2 N.C
1 CHASSIS GND
1 DC OUT (+B)
2 SERIAL CONT
3 SS GND
4 CHASSIS GND
5 CHASSIS GND
TO RM-57P BOARD CN101
(See Page 141)
ZOOM SWITCH UNIT
CHASSIS GND
W941
UN CAM 10
UN CAM POWER SW 9
UN CAM S/S SW 8
EAR PHONE GND 7
EAR PHONE OUT 6
DC OUT 5
SERIAL CONT 4
SS GND 3
N.C. 2
CHASSIS GND 1
JL921
JL922
JL923
JL942
JL941
JL944
JL945
JL946
JL943
SW-158P BOARD
S921
LOCK
STANBY
S922
START/STOP
D944 MA8082M
D945 MA8082M
C945 1000p B
C944 1000p B
C942 1000p B
C943 1000p B
D941 MA8082M
D942 RD12M-B2
D943 1S2837
L944 1μH 3225
L945 1μH 3225
L941 1μH 3225
L942 1μH 3225
L943 1μH 3225
J942
J941
REMOTE

CB-34P (BOARD LINK), CF-22P, CF-23P, CF-24P, CF-25P (CAMERA FUNCTION SWITCH) PRINTED WIRING BOARDS

— Ref. No. CB-34P, CF-22P BOARDS: 8000, CF-23P BOARD: 7000, CF-24P BOARD: 10000, CF-25P BOARD: 9000 series —

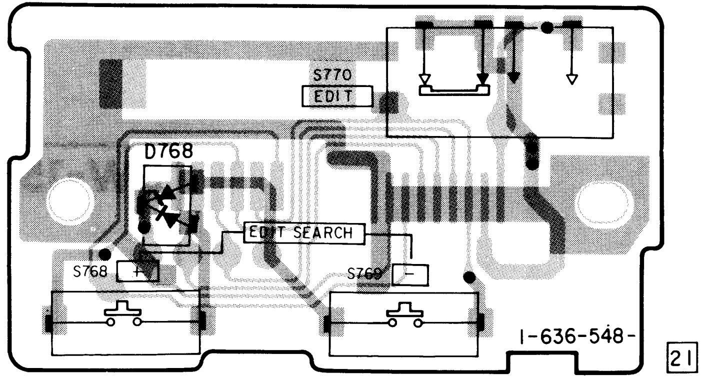
A-7071-356-A CF-23 (P) BOARD, COMPLETE
****
(DIODE)

D751	8-719-110-03	DIODE	RD7.5ES-B2
D751	8-719-420-15	DIODE	MA8082-M(TX)
D751	8-719-420-14	DIODE	MA8082-M
D751	8-719-977-34	DIODE	DTZ12
D752	8-719-110-03	DIODE	RD7.5ES-B2
D752	8-719-420-15	DIODE	MA8082-M(TX)
D752	8-719-420-14	DIODE	MA8082-M
D752	8-719-977-34	DIODE	DTZ12
D755	8-719-420-41	DIODE	MA123

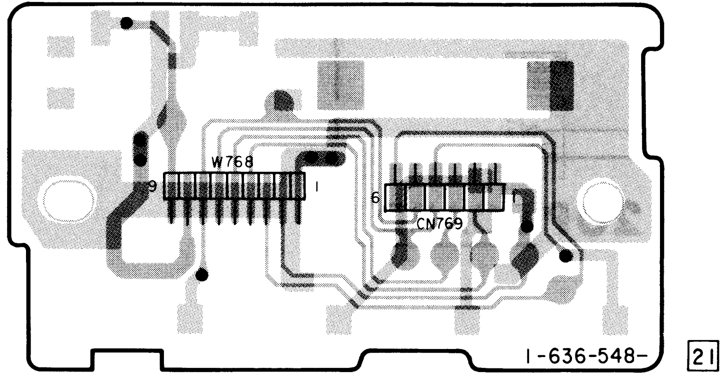
A-7071-359-A CF-25 (P) BOARD, COMPLETE
****
(DIODE)

D768	8-719-400-18	DIODE	MA152WK

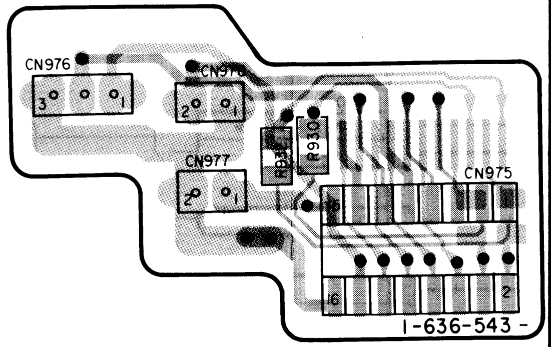
CF-25P BOARD (COMPONENT SIDE)


S770
EDIT
D768
EDIT SEARCH
S768
+
S769
−
1-636-548-
21

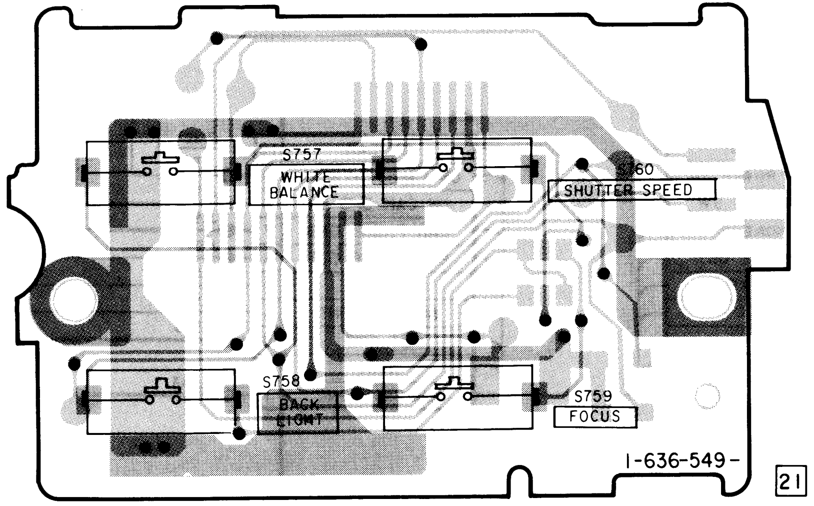
CF-25P BOARD (CONDUCTOR SIDE)


W768
9
1
6
CN769
1-636-548-
21

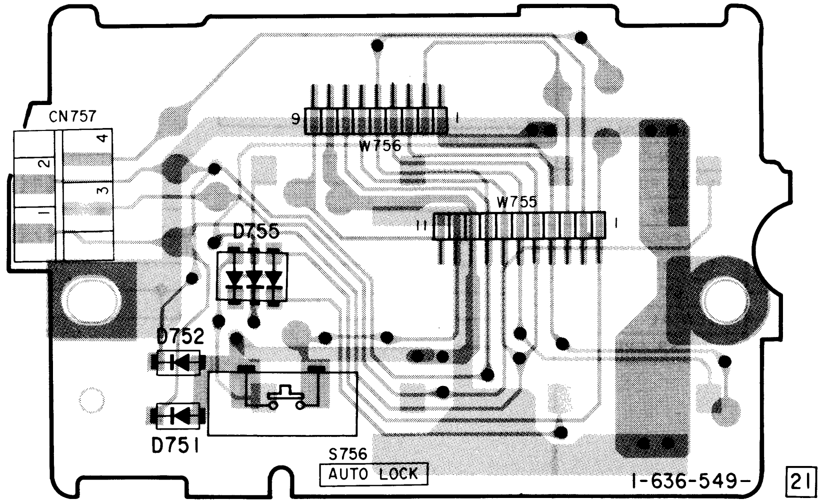
CB-34P BOARD (COMPONENT SIDE)


CN976
3
1
CN978
2
1
CN977
2
1
R930
CN975
6
2
1-636-543-

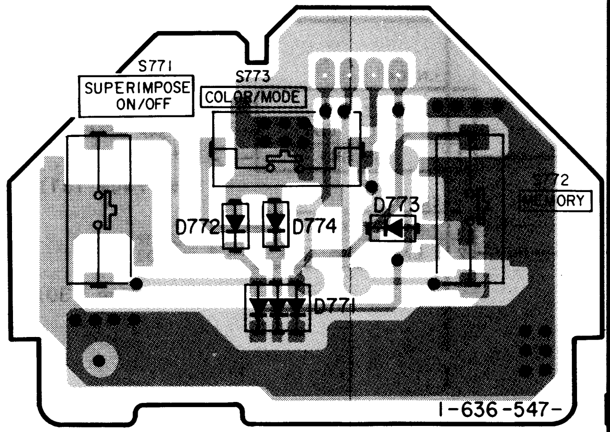
CF-23P BOARD (COMPONENT SIDE)


S757
WHITE BALANCE
S760
SHUTTER SPEED
S758
BACK LIGHT
S759
FOCUS
1-636-549-
21

CF-23P BOARD (CONDUCTOR SIDE)


CN757
4
2
3
1
9
W756
1
11
W755
1
D755
D752
D751
S756
AUTO LOCK
1-636-549-
21

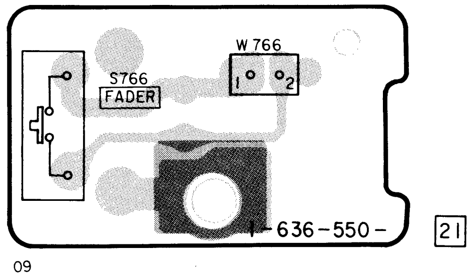
CF-24P BOARD (COMPONENT SIDE)


S771
SUPERIMPOSE ON/OFF
S773
COLOR/MODE
S772
MEMORY
D772
D774
D773
D771
1-636-547-

A-7071-358-A CF-24 (P) BOARD, COMPLETE
****
(DIODE)

D771	8-719-404-40	DIODE	MA121

CF-22P BOARD

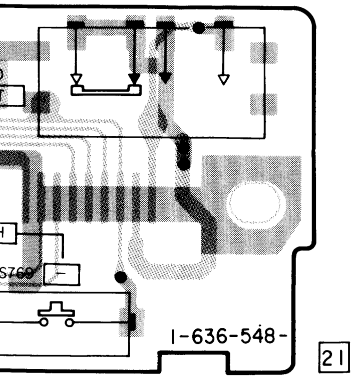

S766
FADER
W766
1
2
1-636-550-
21
09

A-7071-359-A CF-25 (P) BOARD, COMPLETE
****

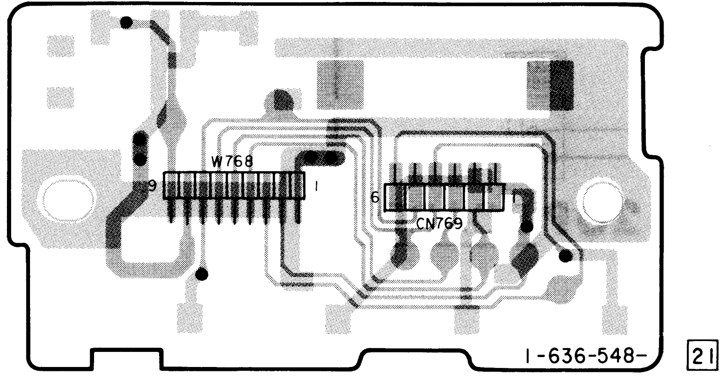
(DIODE)

D768	8-719-400-18	DIODE	MA152WK

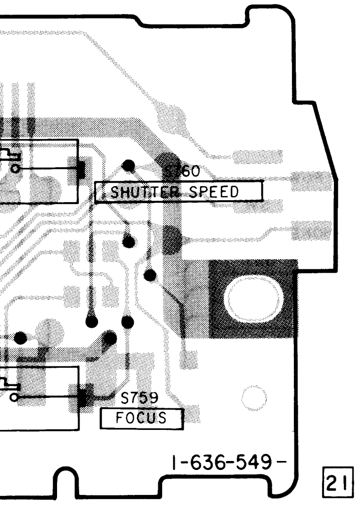
NENT SIDE)


S769
1-636-548-
21

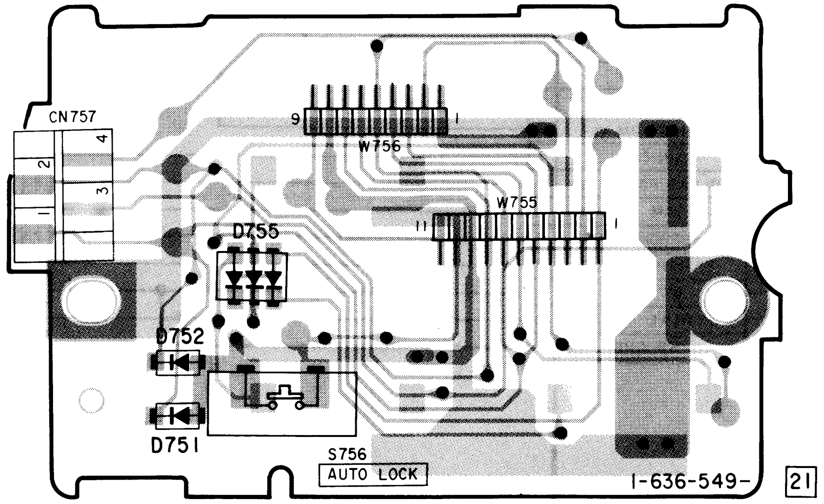
CF-25P BOARD (CONDUCTOR SIDE)

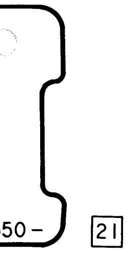

W768
9
1
6
CN769
1-636-548-
21

SIDE)

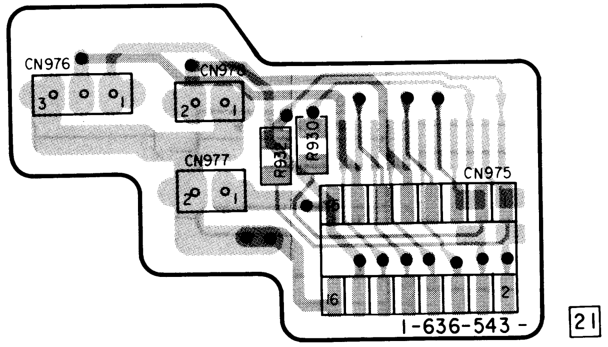

S760
SHUTTER SPEED
S759
FOCUS
1-636-549-
21

CF-23P BOARD (CONDUCTOR SIDE)

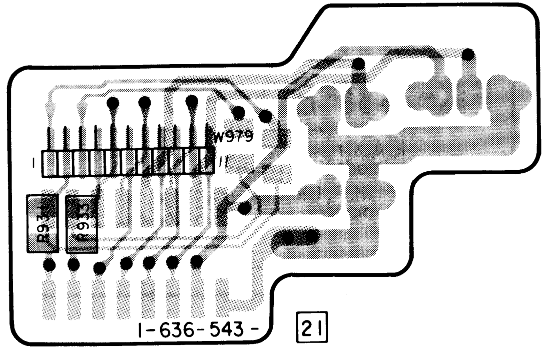

CN757
4
2
3
1
9
W756
1
11
W755
1
D755
D752
D751
S756
AUTO LOCK
1-636-549-
21



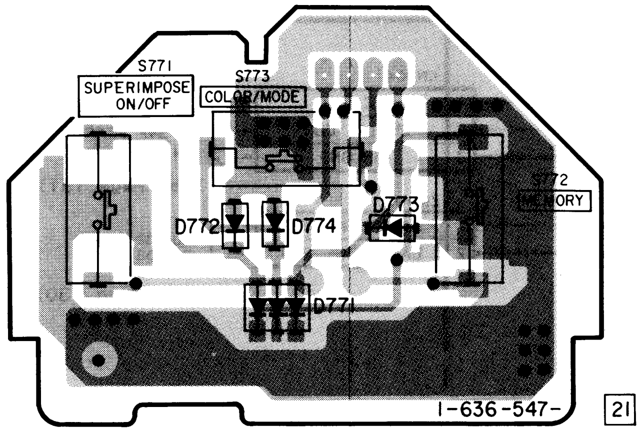
CB-34P BOARD (COMPONENT SIDE)


CN976
3
1
CN978
2
1
CN977
2
1
R930
R931
CN975
2
16
1-636-543 -
21

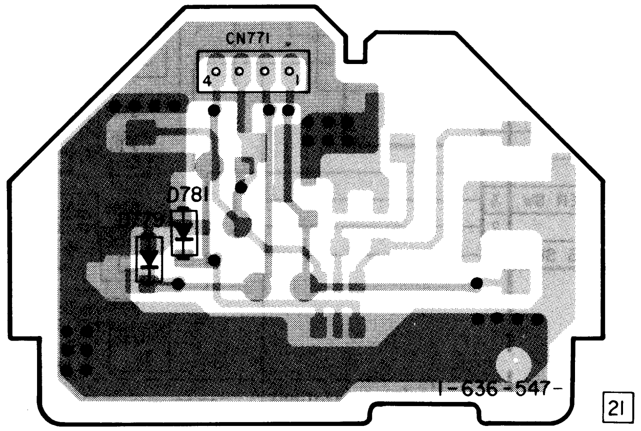
CB-34P BOARD (CONDUCTOR SIDE)


W979
1
11
R931
R930
1-636-543 -
21

CF-24P BOARD (COMPONENT SIDE)


S771
SUPERIMPOSE ON/OFF
S773
COLOR/MODE
S772
MEMORY
D772
D774
D773
D771
1-636-547-
21

CF-24P BOARD (CONDUCTOR SIDE)


CN771
4
1
D781
1-636-547-
21

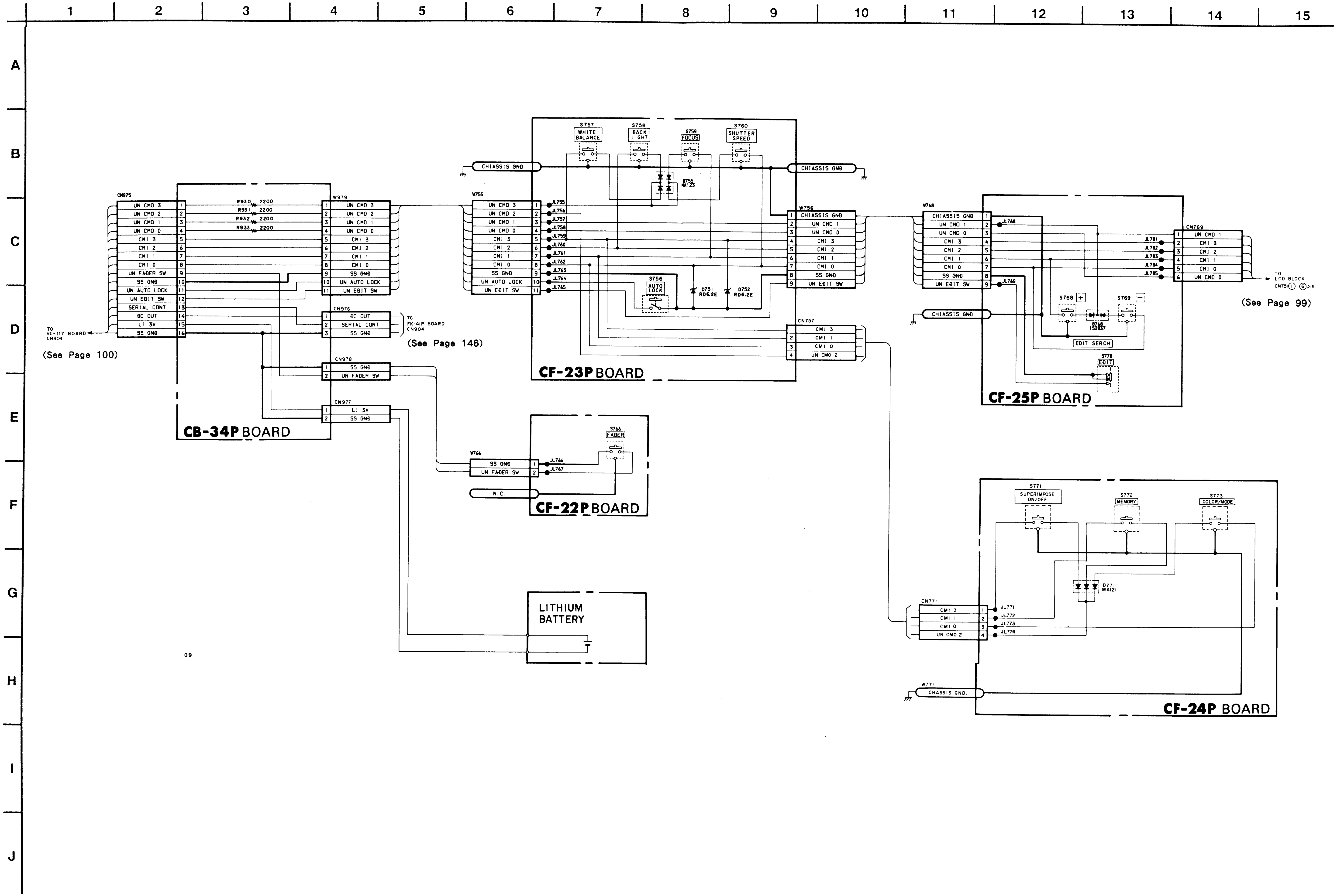
A-7071-358-A CF-24 (P) BOARD, COMPLETE
****

(DIODE)

D771	8-719-404-40	DIODE	MA121

CB-34P (BOARD LINK), CF-22P, CF-23P, CF-24P, CF-25P (CAMERA FUNCTION SWITCH) SCHEMATIC DIAGRAMS

— Ref. No. CB-34P, CF-22P BOARDS: 8000, CF-23P BOARD: 7000, CF-24P BOARD: 10000, CF-25P BOARD: 9000 series —

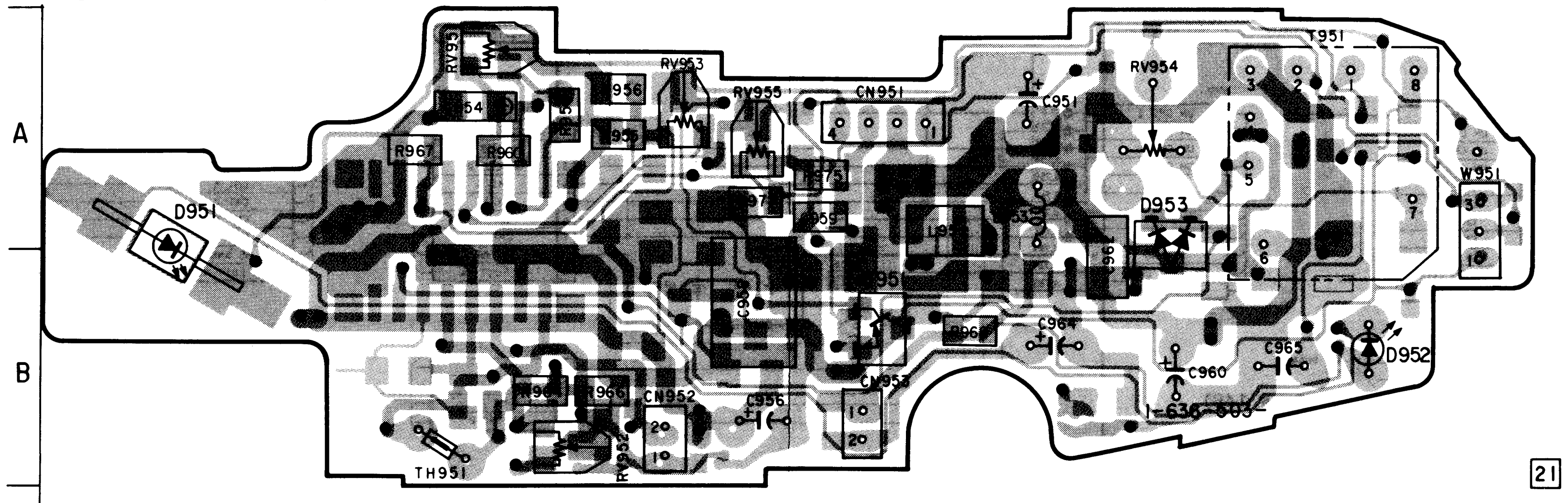

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
A
B
C
D
E
F
G
H
I
J
CN975
UN CMO 3
UN CMO 2
UN CMO 1
UN CMO 0
CMI 3
CMI 2
CMI 1
CMI 0
UN FADER SW
SS GND
UN AUTO LOCK
UN EDIT SW
SERIAL CONT
DC OUT
LI 3V
SS GND
TO VC-117 BOARD CN804
(See Page 100)
R930 2200
R931 2200
R932 2200
R933 2200
W979
UN CMO 3
UN CMO 2
UN CMO 1
UN CMO 0
CMI 3
CMI 2
CMI 1
CMI 0
SS GND
UN AUTO LOCK
UN EDIT SW
CN976
DC OUT
SERIAL CONT
SS GND
TC FK-41P BOARD CN904
(See Page 146)
CN978
SS GND
UN FADER SW
CN977
LI 3V
SS GND
CB-34P BOARD
09
CHIASSIS GND
S757 WHITE BALANCE
S758 BACK LIGHT
S759 FOCUS
S760 SHUTTER SPEED
D755 MA123
CHIASSIS GND
W755
UN CMO 3
UN CMO 2
UN CMO 1
UN CMO 0
CMI 3
CMI 2
CMI 1
CMI 0
SS GND
UN AUTO LOCK
UN EDIT SW
JL755
JL756
JL757
JL758
JL759
JL760
JL761
JL762
JL763
JL764
JL765
S756 AUTO LOCK
D751 RD6.2E
D752 RD6.2E
W756
CHIASSIS GND
UN CMO 1
UN CMO 0
CMI 3
CMI 2
CMI 1
CMI 0
SS GND
UN EDIT SW
CN757
CMI 3
CMI 1
CMI 0
UN CMO 2
CF-23P BOARD
W766
SS GND
UN FADER SW
JL766
JL767
S766 FADER
N.C.
CF-22P BOARD
LITHIUM BATTERY
W768
CHIASSIS GND
UN CMO 1
UN CMO 0
CMI 3
CMI 2
CMI 1
CMI 0
SS GND
UN EDIT SW
JL768
JL769
CHIASSIS GND
S768 +
S769 −
D768 1S2837
EDIT SERCH
S770 EDIT
JL781
JL782
JL783
JL784
JL785
CN769
UN CMO 1
CMI 3
CMI 2
CMI 1
CMI 0
UN CMO 0
TO LCD BLOCK CN751①-⑥pin
(See Page 99)
CF-25P BOARD
S771 SUPERIMPOSE ON/OFF
S772 MEMORY
S773 COLOR/MODE
D771 MA121
CN771
CMI 3
CMI 1
CMI 0
UN CMO 2
JL771
JL772
JL773
JL774
W771
CHASSIS GND.
CF-24P BOARD

VF-41P (VIEWFINDER) PRINTED WIRING BOARD

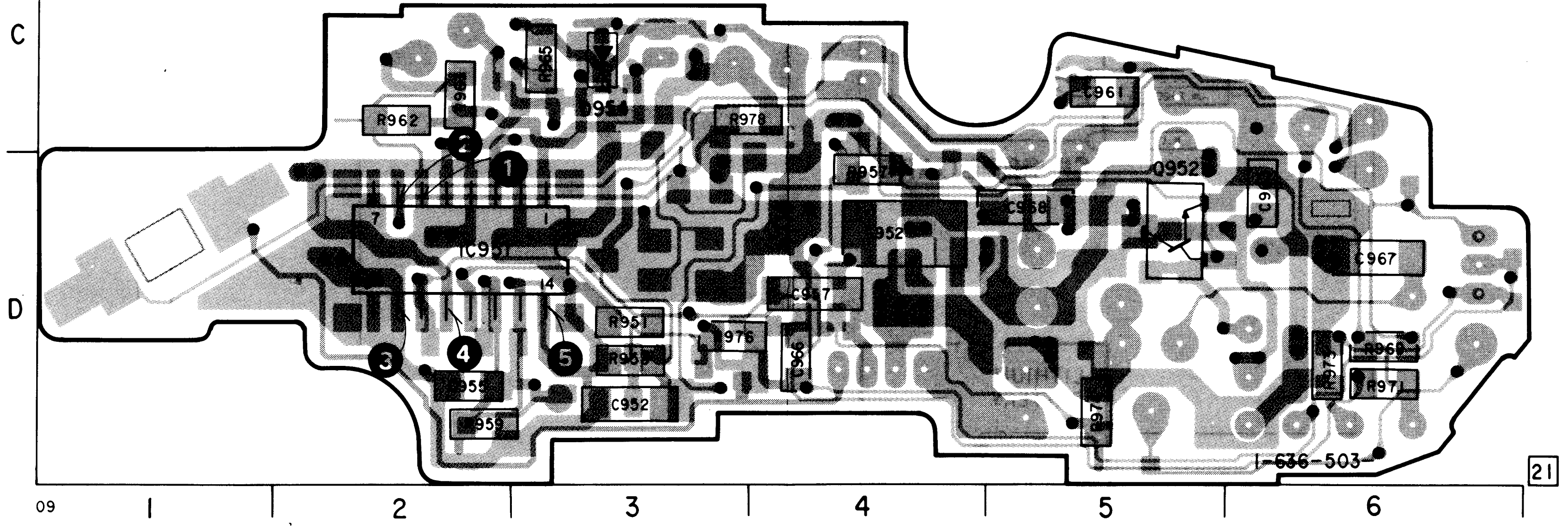
— Ref. No. VF-41P BOARD: 3000 series —

A-7062-629-A	VF-41 (P) BOARD, COMPLETE		
	**************************		
	⟨ DIODE ⟩		
D951	8-719-820-65	DIODE	TLS221
D952	8-719-984-02	LED	BR4371F
D953	8-719-400-20	DIODE	MA152WA
D954	8-719-420-15	DIODE	MA8082-M(TX)
	⟨ IC ⟩		
IC951	8-759-420-01	IC	AN2512S
	⟨ TRANSISTOR ⟩		
Q951	8-729-216-31	TRANSISTOR	2SA1163-G
Q952	8-729-106-68	TRANSISTOR	2SD1615A-GP

VF-41P BOARD (COMPONENT SIDE)


A
B
RV951
RV953
RV955
CN951
C951
RV954
T951
W951
R967
R968
D951
D953
D952
C964
C960
C965
R969
R966
CN952
C956
CN953
TH951
RV952
1-636-503
21

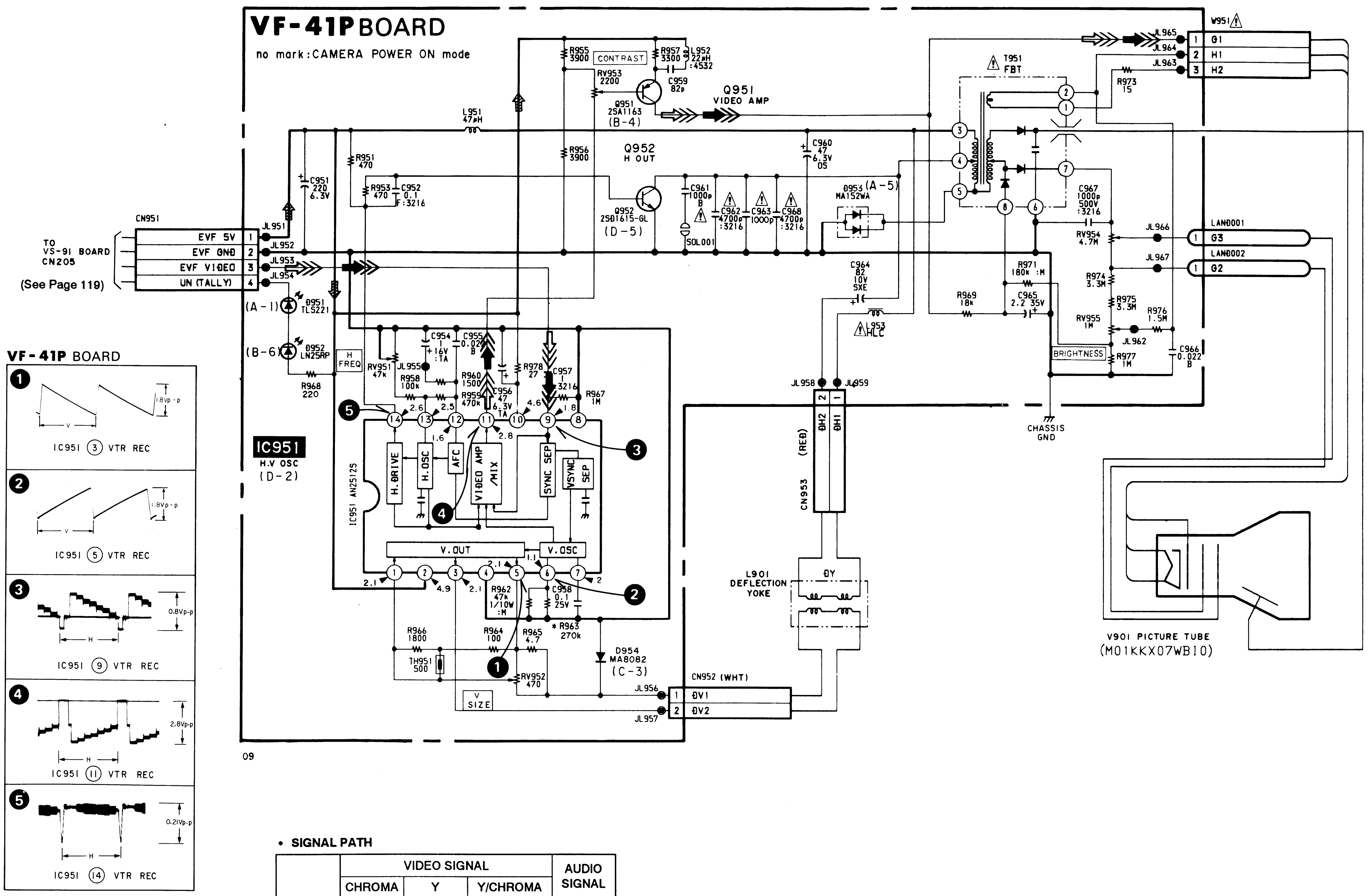
VF-41P BOARD (CONDUCTOR SIDE)


C
D
R962
R965
C961
R978
Q952
R957
C958
C967
IC951
R951
R976
C957
C966
C952
R955
R959
R969
R971
1-636-503
21
1
2
3
4
5
6
09

VIEW FINDER VIEW FINDER

VF-41P (VIEWFINDER) SCHEMATIC DIAGRAM

— Ref. No. VF-41P BOARD: 3000 series —


VF-41P BOARD
no mark:CAMERA POWER ON mode
CN951
TO VS-91 BOARD CN205
(See Page 119)
EVF 5V 1
EVF GND 2
EVF VIDEO 3
UN (TALLY) 4
JL951
JL952
JL953
JL954
D951 TL5221 (A-1)
D952 LN25RP (B-6)
R968 220
H FREQ
RV951 47k
JL955
R958 100k
C954 1 16V :TA
C955 0.022 B
R960 1500
R959 470k
C956 47 6.3V TA
R978 27
C957 1 3216
R967 1M
L951 47μH
R951 470
C951 220 6.3V
R953 470
C952 0.1 F:3216
R955 3900
CONTRAST
RV953 2200
R957 3300
L952 22μH :4532
C959 82p
Q951 2SA1163 (B-4)
Q951 VIDEO AMP
R956 3900
Q952 H OUT
Q952 2SD1615-GL (D-5)
C961 1000p B
SOL001
C962 4700p :3216
C963 1000p
C968 4700p :3216
C960 47 6.3V OS
D953 MA152WA (A-5)
T951 FBT
JL965
JL964
JL963
R973 15
W951
1 G1
2 H1
3 H2
C967 1000p 500V :3216
RV954 4.7M
JL966
LAN0001 G3
JL967
LAN0002 G2
R971 180k :M
C965 2.2 35V
R969 18k
C964 82 10V SXE
L953 HLC
R974 3.3M
R975 3.3M
R976 1.5M
RV955 1M
JL962
C966 0.022 B
BRIGHTNESS
R977 1M
CHASSIS GND
JL958
JL959
CN953 (RED)
2 DH2
1 DH1
L901 DEFLECTION YOKE
DY
V901 PICTURE TUBE
(M01KKX07WB10)
CN952 (WHT)
1 DV1
2 DV2
JL956
JL957
D954 MA8082 (C-3)
* R963 270k
C958 0.1 25V
R965 4.7
R962 47k 1/10W :M
R964 100
RV952 470
V SIZE
TH951 500
R966 1800
IC951
H.V OSC
(D-2)
IC951 AN2512S
H.DRIVE
H.OSC
AFC
VIDEO AMP /MIX
SYNC SEP
VSYNC SEP
V.OUT
V.OSC
2.6
2.5
1.6
2.8
4.6
1.8
2.1
4.9
2.1
2.1
1.1
2
09
VF-41P BOARD
1.8Vp-p
V
IC951 ③ VTR REC
1.8Vp-p
V
IC951 ⑤ VTR REC
0.8Vp-p
H
IC951 ⑨ VTR REC
2.8Vp-p
H
IC951 ⑪ VTR REC
0.21Vp-p
H
IC951 ⑭ VTR REC

- **SIGNAL PATH**

	VIDEO SIGNAL			AUDIO SIGNAL
	CHROMA	Y	Y/CHROMA	
REC			➡	
PB			⇨	

DD-31P (POWER) PRINTED WIRING BOARD

— Ref. No. DD-31P BOARD: 3000 series —

A-7062-627-A DD-31 (P) BOARD, COMPLETE
****

(DIODE)

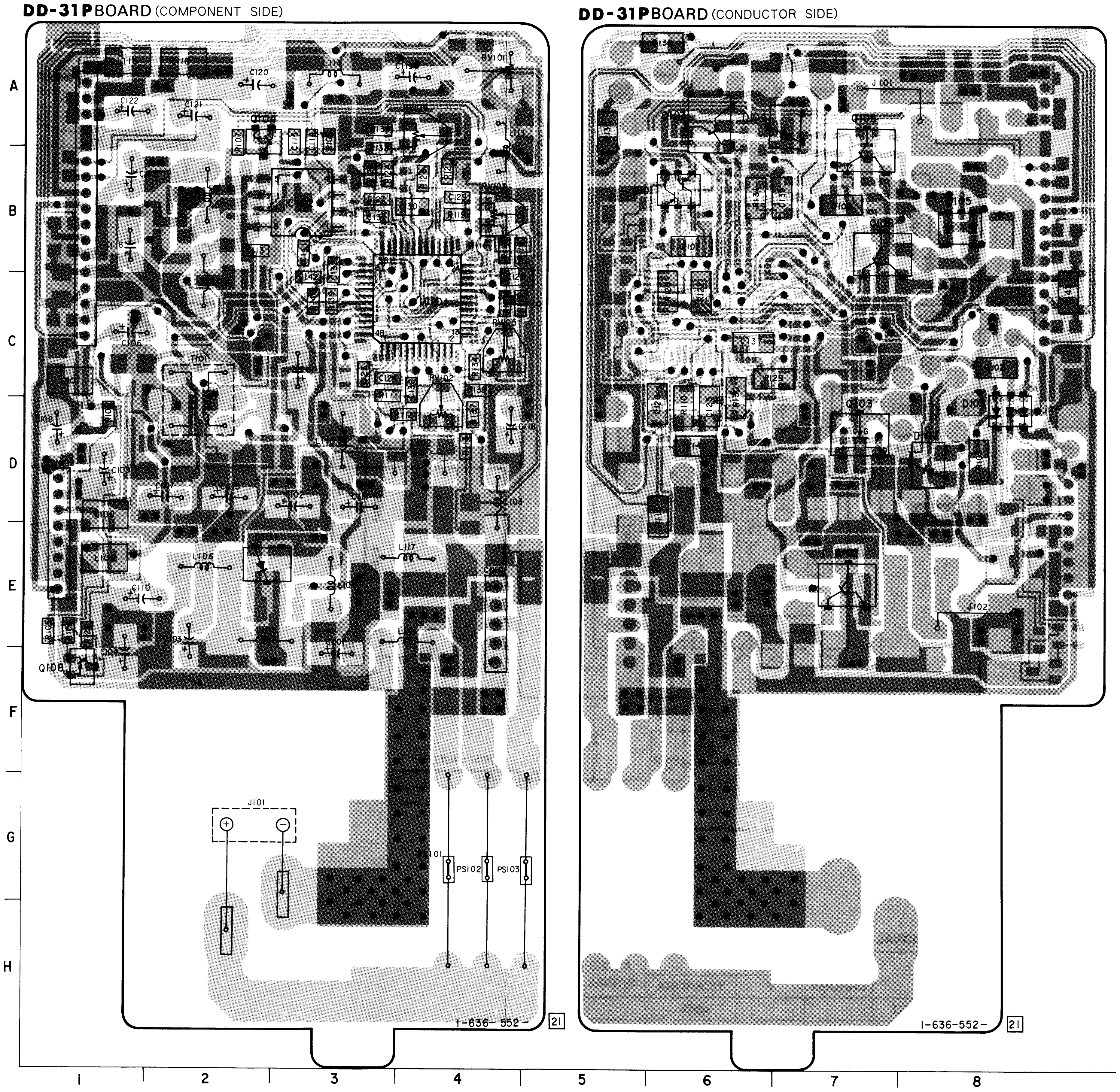
D101	8-719-941-04	DIODE	SB007-03CP
D102	8-719-938-75	DIODE	SB05-05CP
D103	8-719-951-22	IC	IMN10
D104	8-719-941-04	DIODE	SB007-03CP
D105	8-719-981-59	DIODE	FC805

(IC)

IC101	8-759-500-42	IC	MB3783PFV
IC102	8-759-998-94	IC	LM311D

(TRANSISTOR)

Q101	8-729-421-90	TRANSISTOR	XN4113
Q102	8-729-805-25	TRANSISTOR	2SB1121
Q103	8-729-822-82	TRANSISTOR	2SK1311
Q104	8-729-119-83	TRANSISTOR	2SC4175-B3
Q105	8-729-805-25	TRANSISTOR	2SB1121
Q106	8-729-805-25	TRANSISTOR	2SB1121
Q107	8-729-805-25	TRANSISTOR	2SB1121
Q108	8-729-905-12	TRANSISTOR	DTA144EU

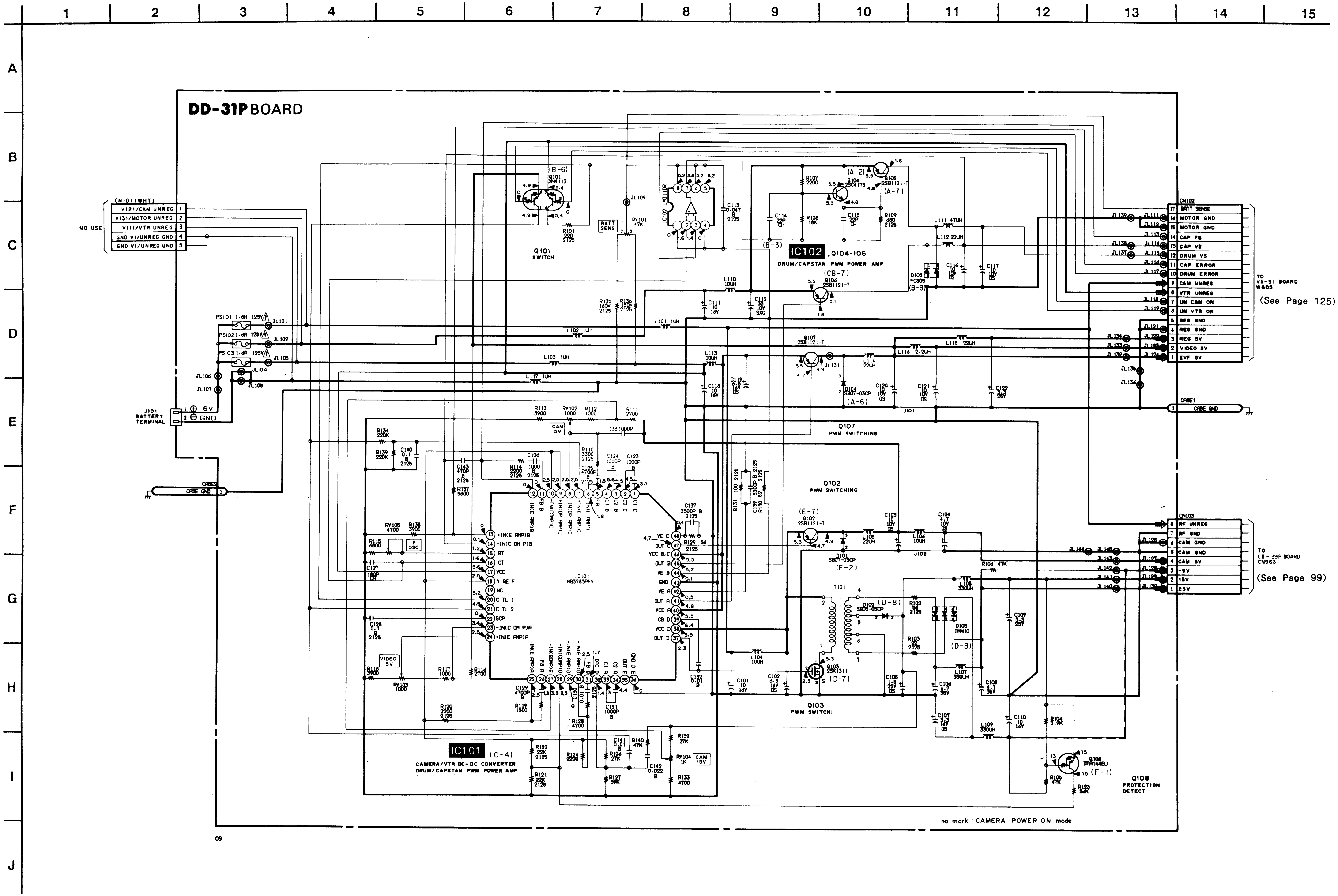

DD-31P BOARD (COMPONENT SIDE)

DD-31P BOARD (CONDUCTOR SIDE)

A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8
J101
PS101
PS102
PS103
RV101
RV102
T101
L106
L117
C110
C120
C121
C122
C106
Q101
Q104
Q108
J102
Q103
1-636-552-
21

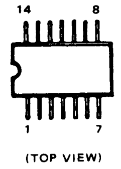
DD-31P (POWER) SCHEMATIC DIAGRAM

— Ref. No. DD-31P BOARD: 3000 series —

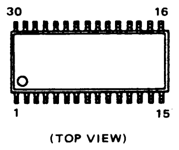

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
A B C D E F G H I J
DD-31P BOARD
CN101 (WHT)
V121/CAM UNREG 1
V131/MOTOR UNREG 2
V111/VTR UNREG 3
GND VI/UNREG GND 4
GND VI/UNREG GND 5
NO USE
PS101 1.6A 125V
PS102 1.6A 125V
PS103 1.6A 125V
J101 BATTERY TERMINAL
1 ⊕ 6V
2 ⊖ GND
CASE2 CASE GND
Q101 DN4113
Q101 SWITCH
BATT SENS
RV101 47K
IC102 LM3110R
IC102, Q104-106
DRUM/CAPSTAN PWM POWER AMP
Q104 2SC4175
Q105 2SB1121-T
Q106 2SB1121-T
D105 FC805
L111 47UH
L112 22UH
CN102
17 BATT SENSE
16 MOTOR GND
15 MOTOR GND
14 CAP FB
13 CAP VS
12 DRUM VS
11 CAP ERROR
10 DRUM ERROR
9 CAM UNREG
8 VTR UNREG
7 UN CAM ON
6 UN VTR ON
5 REG GND
4 REG GND
3 REG 5V
2 VIDEO 5V
1 EVF 5V
TO VS-91 BOARD W606
(See Page 125)
CASE1 CASE GND
Q107 2SB1121-T
Q107 PWM SWITCHING
D104 SB07-03CP
L115 22UH
L116 2.2UH
L114 22UH
IC101 MB3783PFV
IC101 (C-4)
CAMERA/VTR DC-DC CONVERTER
DRUM/CAPSTAN PWM POWER AMP
CAM 5V
VIDEO 5V
CAM 15V
F OSC
Q102 2SB1121-T
Q102 PWM SWITCHING
D101 SB07-03CP
T101
D102 SB05-05CP
D103 1MN10
Q103 2SK1311
Q103 PWM SWITCHI
CN103
8 RF UNREG
7 RF GND
6 CAM GND
5 CAM GND
4 CAM 5V
3 -9V
2 15V
1 23V
TO CB-39P BOARD CN963
(See Page 99)
Q108 DTA144EU
Q108 PROTECTION DETECT
no mark : CAMERA POWER ON mode

4-3. SEMICONDUCTORS

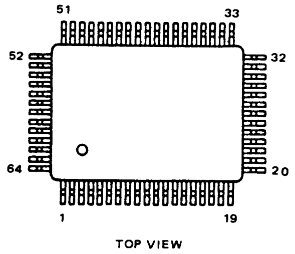
AN2512S


14
8
1
7
(TOP VIEW)

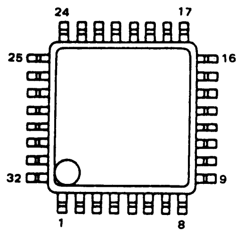
CXA1047M
CXA1127M


30
16
1
15
(TOP VIEW)

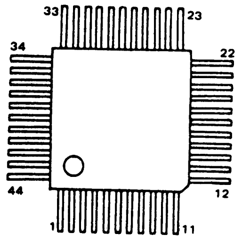
CXA1200BQ
μPD7503GF-J59


51
33
52
32
64
20
1
19
TOP VIEW

CXA1201Q


24
17
25
16
32
9
1
8

CXA1204Q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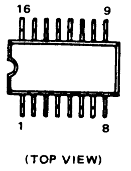
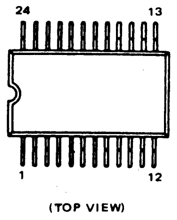
23
34
22
44
12
1
11

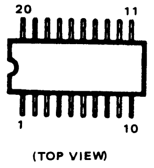
CXD1172AM


16
9
1
8
(TOP VIEW)

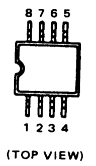
CXL1503N


24
13
1
12
(TOP VIEW)

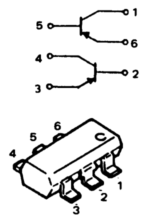
MB88341PFV
MB88346PFV
MPC1737M
μPD6145G


20
11
1
10
(TOP VIEW)

RC3414M
μPC1037GR


8 7 6 5
1 2 3 4
(TOP VIEW)

IMT1US
FC101
XN4113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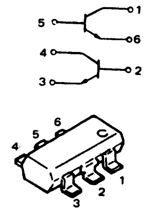
XN4210
XN4213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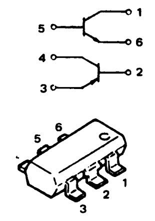
XN4601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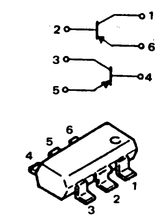
XN6401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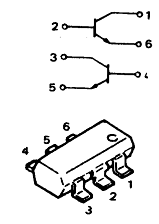
XN6215
XN6501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6
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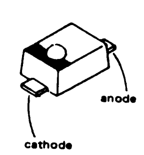
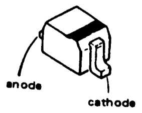
4
1
2
3

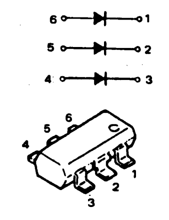
1T32


anode
cathode

MA110
MA111


anode
cathode

MA121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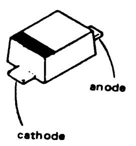
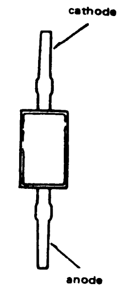
3

MA8082-M


anode
cathode

TLS221


cathode
anode

SECTION 5

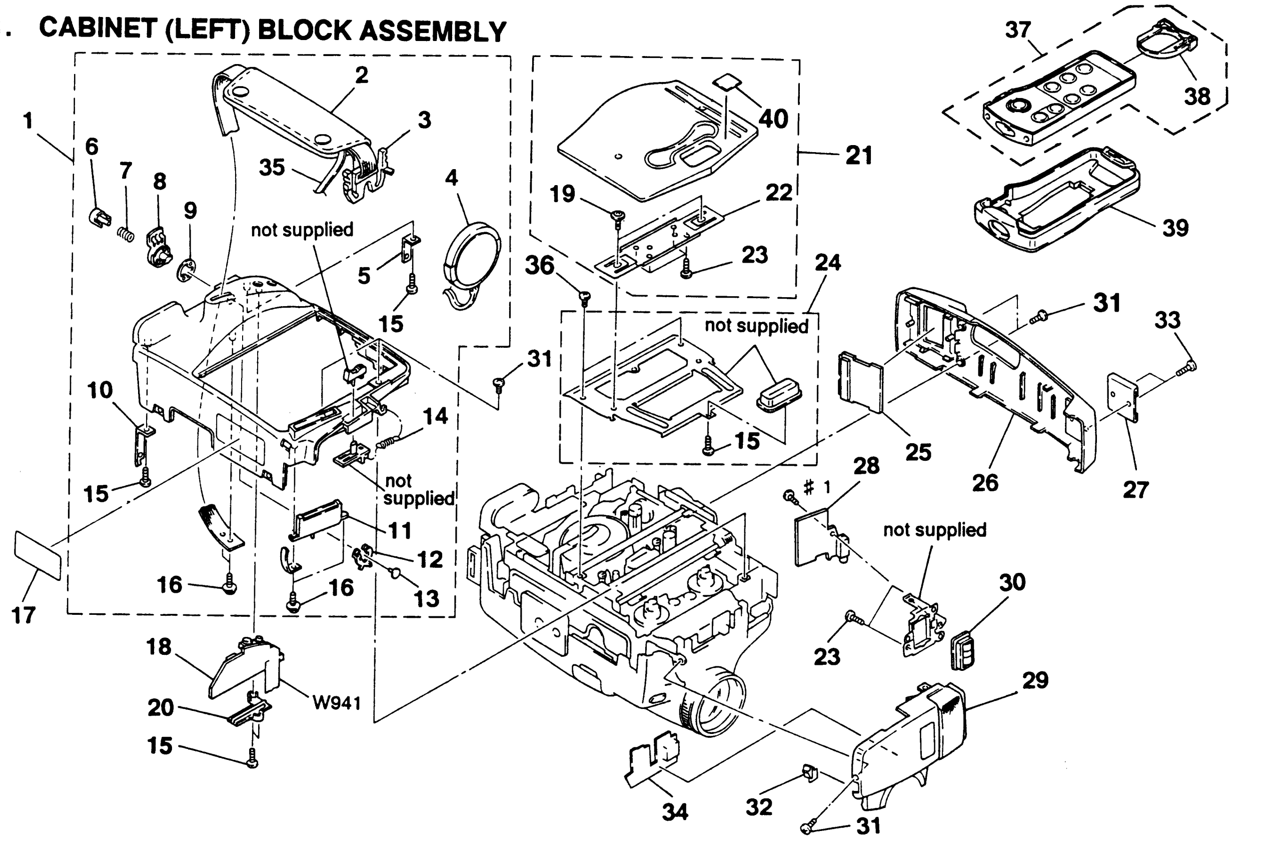
EXPLODED VIEWS

NOTE:

- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked " ∗ " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- Hardware (# mark) list is given in the last of this parts list.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

5-1. CABINET (LEFT) BLOCK ASSEMBLY


1
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23
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27
28
29
30
31
31
31
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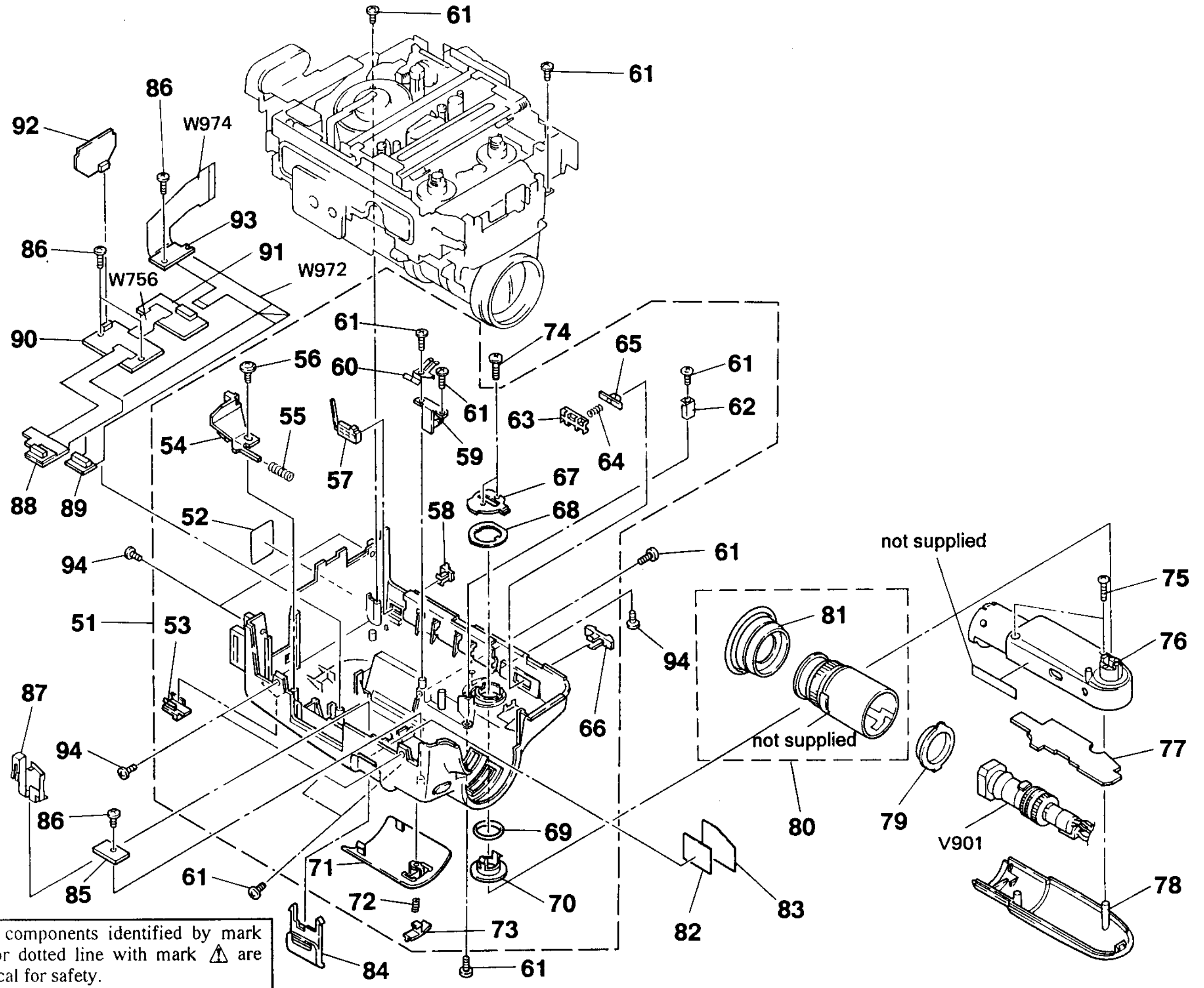
32
33
34
35
36
37
38
39
40
# 1
W941
not supplied
not supplied
not supplied
not supplied

Ref. No.	Part No.	Description	Remark
1	A-7081-369-A	CABINET (L) BLOCK ASSY (E, Australian)	
1	A-7081-490-A	CABINET (L) BLOCK ASSY (AEP, UK)	
2	3-719-323-01	BELT, GRIP	
3	3-749-907-01	HOLDER (M), GRIP BELT	
4	A-7091-592-A	CAP ASSY, LENS	
5	3-749-734-01	JOINT (B), LR	
6	3-736-343-01	BUTTON, S/S	
7	3-578-221-00	SPRING, COMPRESSION	
8	3-736-391-01	KNOB, STAND-BY	
9	3-736-364-01	SPRING	
10	3-749-733-01	JOINT, LR	
* 11	3-749-908-01	HOLDER (F), GRIP BELT	
12	3-749-745-01	HOLDER, STAND-BY KNOB	
13	3-749-732-01	PIN, S/S RELAY	
14	3-674-402-00	SPRING, TENSION	
15	3-719-408-01	SCREW (B2), TAPPING, P3	
16	3-669-480-21	+ PTPWH 2	
* 17	3-946-383-01	LABEL, MODEL NUMBER (AE)(AEP)	
* 17	3-947-054-01	LABEL, MODEL NUMBER (UK)(UK, E, Australian)	
* 18	A-7071-362-A	SW-158 (P) BOARD, COMPLETE	
19	3-749-904-02	SCREW, STEP, CASSETTE LID	
20	3-749-746-01	RETAINER, SW PC BOARD	
21	A-7081-901-A	LID BLOCK ASSY, CASSETTE	
22	3-749-743-01	SPRING, CASSETTE LID	
23	3-719-601-01	SCREW (B2X5), TAPPING	
24	A-7091-362-D	REINFORCEMENT ASSY, LID	
25	1-809-146-11	DISPLAY BLOCK, LIQUID CRYSTAL	
26	X-3749-169-1	CABINET (T) ASSY	
27	3-724-511-01	SHOE, ACCESSORY	
28	A-7071-536-A	MA-135 BOARD, COMPLETE	
29	X-3941-425-1	CABINET (F) ASSY	
30	1-542-126-11	MICROPHONE UNIT	
31	3-719-381-01	SCREW (M2X4)	
32	3-944-518-01	KNOB, REMOTE CONTROL	
33	3-719-831-01	SCREW (M2X6)	
34	A-7063-119-A	RM-57P BOARD, COMPLETE	
35	3-941-682-01	BELT, STOPPER	
36	3-733-912-01	SCREW (M2X2.5), SPECIAL HEAD	
37	1-465-934-11	REMOTE COMMANDER (CAM CORDER)(RMT-504)	
38	3-944-056-11	LID, BATTERY CASE, LITHIUM	
* 39	3-943-154-11	HOLDER, REMOTE CONTROL	
* 40	3-703-713-41	STICKER, SONY SYMBOL (10)	
W941	1-590-102-11	CABLE, FLAT (FFC-1)	

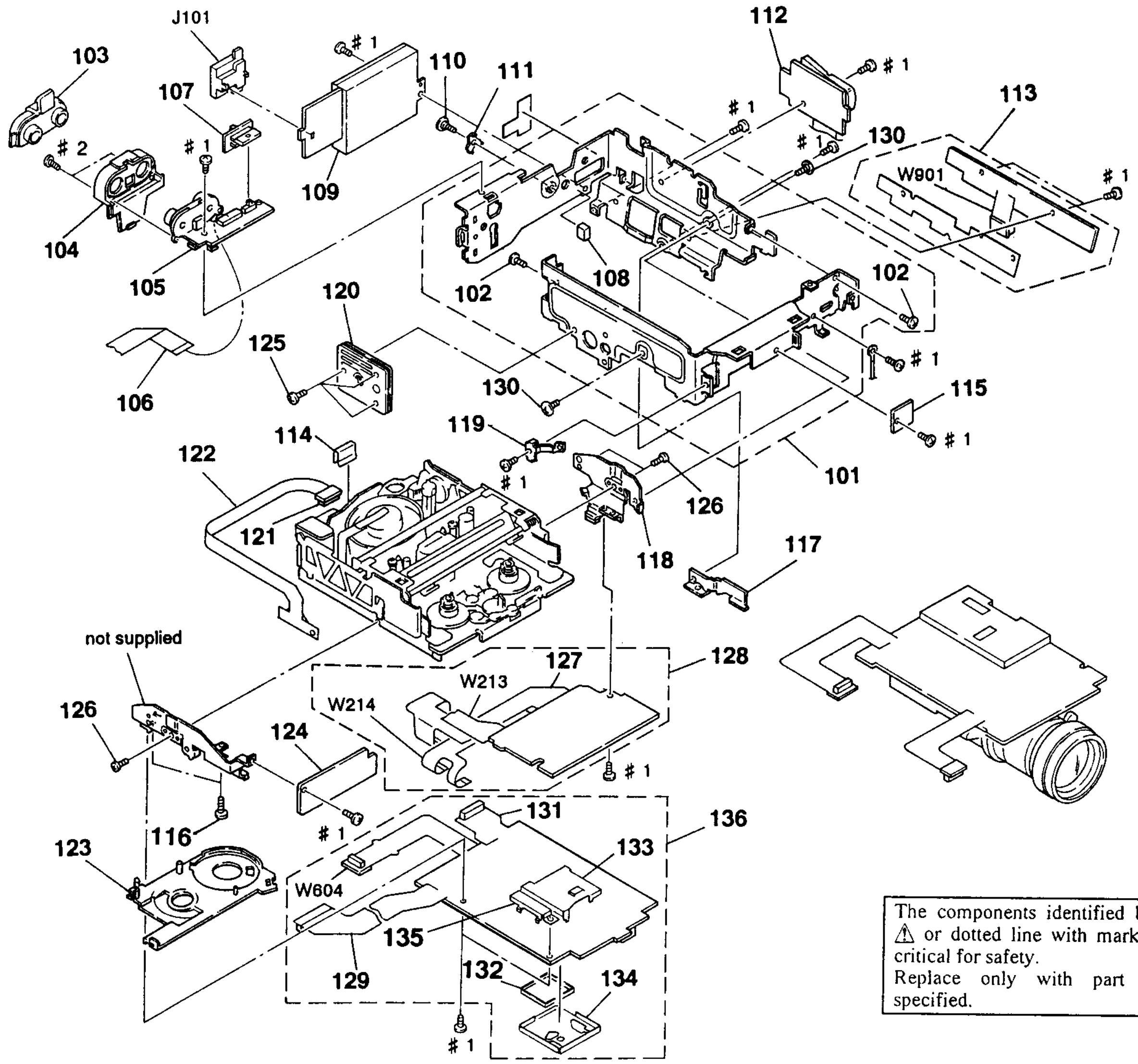
5-2. CABINET (RIGHT) BLOCK ASSEMBLY



The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
51	A-7081-904-A	CABINET (R) BLOCK ASSY (AEP, UK)	
51	A-7081-921-A	CABINET (R) BLOCK ASSY (E, Australian)	
* 52	3-719-683-01	LABEL, BATTERY FITTING	
53	3-749-737-01	BUTTON, BATTERY RELEASE	
54	3-749-770-01	LEVER, RELEASE	
55	2-226-804-00	SPRING, COMPRESSION	
56	3-669-480-21	+ PTPWH 2	
57	3-749-771-01	HOLDER, KNOB (E, Australian)	
58	3-749-756-01	BUTTON (E, Australian)	
59	X-3747-102-1	PIN ASSY, EVF LOCK	
60	3-749-754-01	PLATE, GROUND, LOCK	
61	3-719-408-01	SCREW (B2), TAPPING, P3	
62	3-747-178-01	REINFORCEMENT, TILT LOCK	
63	3-749-769-01	HOLDER, P KNOB	
64	3-303-973-00	SPRING, COMPRESSION	
65	3-749-750-01	BUTTON, P LOCK	
66	3-749-751-01	BUTTON, POWER	
67	3-747-111-01	PLATE, LOCK, TILT	
68	3-747-110-01	SPRING, LEAF, TILT	
69	3-747-112-01	RING, TILT	
70	3-747-109-01	SLEEVE, EVF	
71	3-749-768-31	DOOR, AUTO LOCK	
72	3-944-070-01	SPRING, COMPRESSION	
73	3-749-738-01	BUTTON, AUTO LOCK	
74	3-740-546-11	SCREW (M2X10.5)	
75	3-713-790-31	SCREW (M2X8), TAPPING, P3	
76	X-3940-711-1	CABINET (L) ASSY, EVF	
* 77	A-7062-629-A	VF-41 (P) BOARD, COMPLETE	
78	3-747-149-01	CABINET (R), EVF	
79	3-747-116-01	COVER, CRT	
80	A-7081-863-A	HOLDER BLOCK ASSY, FINDER	
81	3-944-523-01	EYE CUP	
82	3-940-060-01	COVER, TERMINAL BOARD	
83	3-747-157-01	SHEET (T), PROTECTION	
84	3-747-174-03	LID, BATTERY CASE, LITHIUM	
* 85	A-7071-354-A	CF-22 (P) BOARD, COMPLETE	
86	3-719-601-01	SCREW (B2X5), TAPPING	
87	1-537-295-31	TERMINAL BOARD, LITHIUM	
* 88	A-7071-357-A	CB-34 (P) BOARD, COMPLETE	
89	1-636-544-11	CB-35 (P) BOARD	
* 90	A-7071-356-A	CF-23 (P) BOARD, COMPLETE	
* 91	A-7071-359-A	CF-25 (P) BOARD, COMPLETE	
* 92	A-7071-358-A	CF-24 (P) BOARD, COMPLETE	
* 93	A-7071-360-A	JC-10 (P) BOARD, COMPLETE	
94	3-719-381-01	SCREW (M2X4)	
⚠V901	1-452-566-11	CRT ASSY (M01KKX07WB10)	
W756	1-636-589-11	FP-353 FLEXIBLE BOARD	
W972	1-590-108-11	CABLE, FLAT (FFC-7)	
W974	1-590-107-11	CABLE, FLAT (FFC-6)	

5-3. MAIN BOARDS ASSEMBLY


J101
103
107
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106
# 1
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112
# 1
# 1
# 1
130
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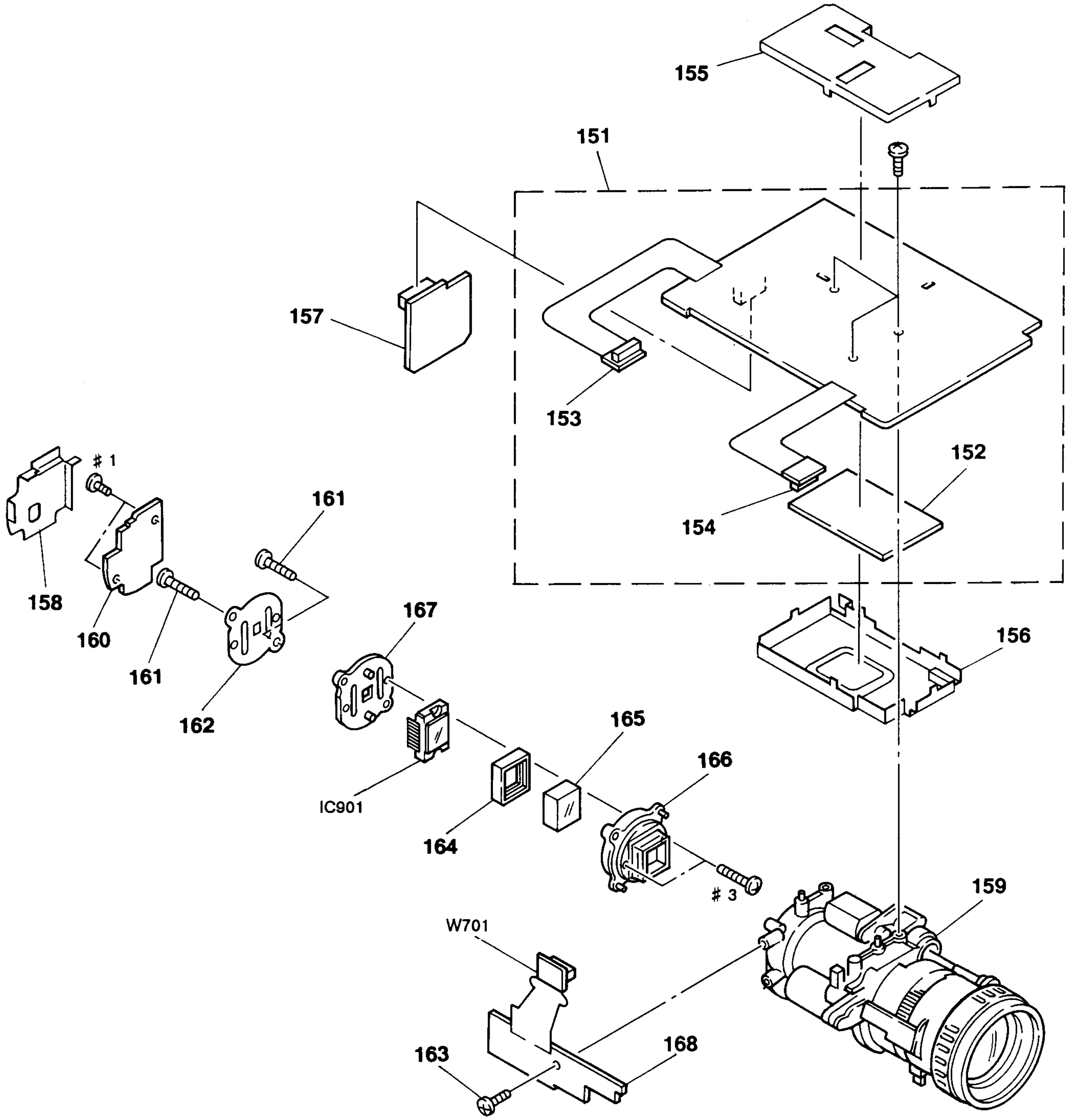
W901
# 1
108
102
102
120
125
130
# 1
115
# 1
114
119
122
# 1
126
101
121
118
117
not supplied
127
128
W213
W214
126
124
# 1
116
123
# 1
131
136
133
W604
135
129
132
134
# 1

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

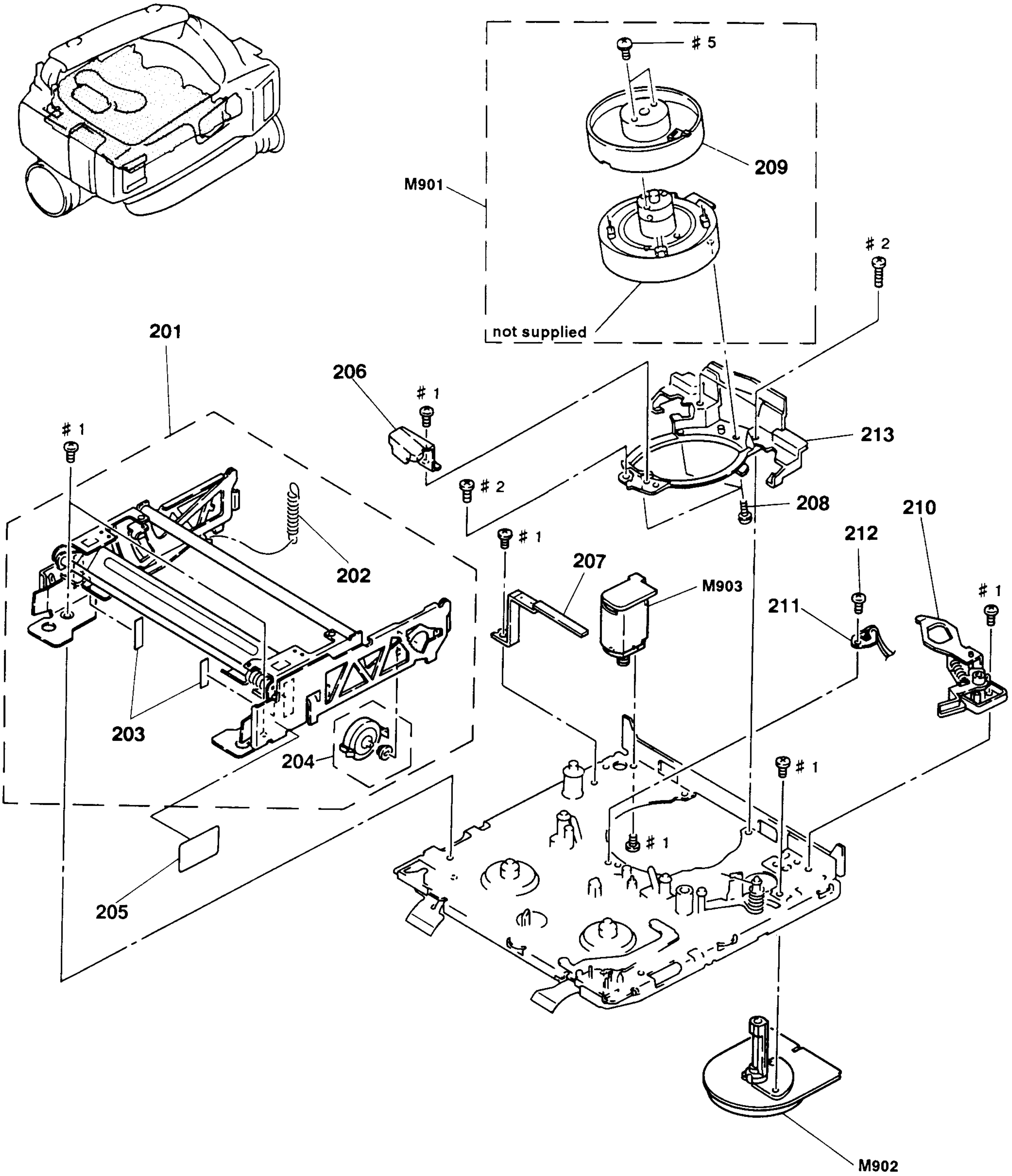
Ref. No.	Part No.	Description	Remark
101	A-7091-359-A	FRAME ASSY, U	
102	3-713-786-51	SCREW (M2X3)	
103	3-941-369-02	CAP (2), AV	
104	3-941-604-02	PANEL (2), JK	
105	1-580-327-11	JACK ASSY, PIN (E,Australian)	
105	1-580-327-21	JACK ASSY, PIN (AEP,UK)	
106	1-590-110-12	CABLE, FLAT (FFC-2)	
107	3-749-741-01	KNOB, IN OUT (E,Australian)	
108	9-911-840-XX	CUSHION	
⚠109	A-7062-627-A	DD-31 (P) BOARD, COMPLETE (DC-DC CONVERTER UNIT)	
110	3-749-905-01	SCREW (FRAME), STEP	
111	3-165-803-01	SPRING, LEAF, GROUND	
112	1-572-496-11	SWITCH, PUSH (ZOOM W/T)	
* 113	A-7071-350-A	FK-41 (P) BOARD, COMPLETE (AEP,UK)	
* 113	A-7071-391-A	FK-41 (P) BOARD, COMPLETE (E,Australian)	
114	3-941-123-01	HOLDER, FP	
* 115	A-7071-349-A	EJ-20 (P) BOARD, COMPLETE	
116	3-719-601-01	SCREW (B2X5), TAPPING	
* 117	3-747-119-01	REINFORCEMENT, LCD	
118	X-3749-168-1	BRACKET (R) ASSY, MD	
* 119	3-749-752-01	BRACKET, CAP STRAP	
120	3-736-396-02	SCREW, TRIPOD	
121	1-569-347-11	CONNECTOR, FPC(TRANSLATION)13P	
122	1-636-498-11	FP-316 FLEXIBLE BOARD	
123	3-749-775-01	COVER, MD	
124	A-7062-991-A	AU-132 BOARD, COMPLETE	
125	3-719-381-01	SCREW (M2X4)	
126	3-703-816-41	SCREW (M1.4X2.5), SPECIAL HEAD	
127	A-7071-266-A	FP-314 FLEXIBLE BOARD, COMPLETE	
* 128	A-7062-624-A	CC-52 (P) BOARD, COMPLETE	
129	1-636-499-11	FP-363 FLEXIBLE BOARD	
130	3-732-791-01	SCREW (M2X3)	
131	1-636-501-11	FP-355 FLEXIBLE BOARD	
* 132	3-736-887-01	PLATE, SHIELD, PAL DELAY LINE	
* 133	3-736-317-01	CASE (LOWER), RP SHIELD	
* 134	3-736-316-01	CASE (UPPER), RP SHIELD	
* 135	3-736-322-01	CASE, FE SHIELD	
136	A-7062-990-A	VS-91 BOARD, COMPLETE (AEP,UK)	
136	A-7062-992-A	VS-91 BOARD, COMPLETE (E,Australian)	
J101	1-537-309-11	TERMINAL BOARD (BATTERY)	
W213	1-636-495-11	FP-312 FLEXIBLE BOARD	
W214	1-636-496-11	FP-313 FLEXIBLE BOARD	
W604	1-630-592-11	FP-184 FLEXIBLE BOARD	
W901	1-636-500-11	FP-319 FLEXIBLE BOARD	

5-4. CAMERA BLOCK ASSEMBLY



Ref. No.	Part No.	Description	Remark
151	A-7062-993-A	VC-117 BOARD, COMPLETE	
152	A-7068-195-A	DT-77LB HIC BOARD, COMPLETE	
153	A-7071-538-A	CB-39P BOARD, COMPLETE	
154	A-7071-539-A	CB-38P BOARD, COMPLETE	
* 155	3-736-320-02	CASE (LOWER), VC SHIELD	
* 156	3-747-166-01	CASE (UPPER), SHIELD, VC	
157	A-7062-995-A	TI-41P BOARD, COMPLETE	
* 158	3-749-757-01	CASE, SHIELD, CCD	
159	1-547-516-11	LENS, ZOOM (VCL-6210WA)	
160	A-7071-537-A	CD-75P BOARD, COMPLETE	
161	3-747-151-21	SCREW (2X12)	
* 162	3-741-525-01	SHEET, INSULATING, CCD	
163	3-719-601-01	SCREW (B2X5), TAPPING	
164	3-749-739-01	RUBBER, SEAL	
165	1-547-445-11	FILTER BLOCK, OPTICAL	
166	3-749-760-01	ADAPTOR, CCD FITTING	
167	3-941-342-11	HOLDER, CCD	
168	A-7062-994-A	LD-54P BOARD, COMPLETE	
IC901	8-752-607-39	IC ICX045BKA-2 (CCD IMAGER)	
W701	1-630-595-21	FP-187 FLEXIBLE BOARD	

5-5. MD BLOCK ASSEMBLY (1)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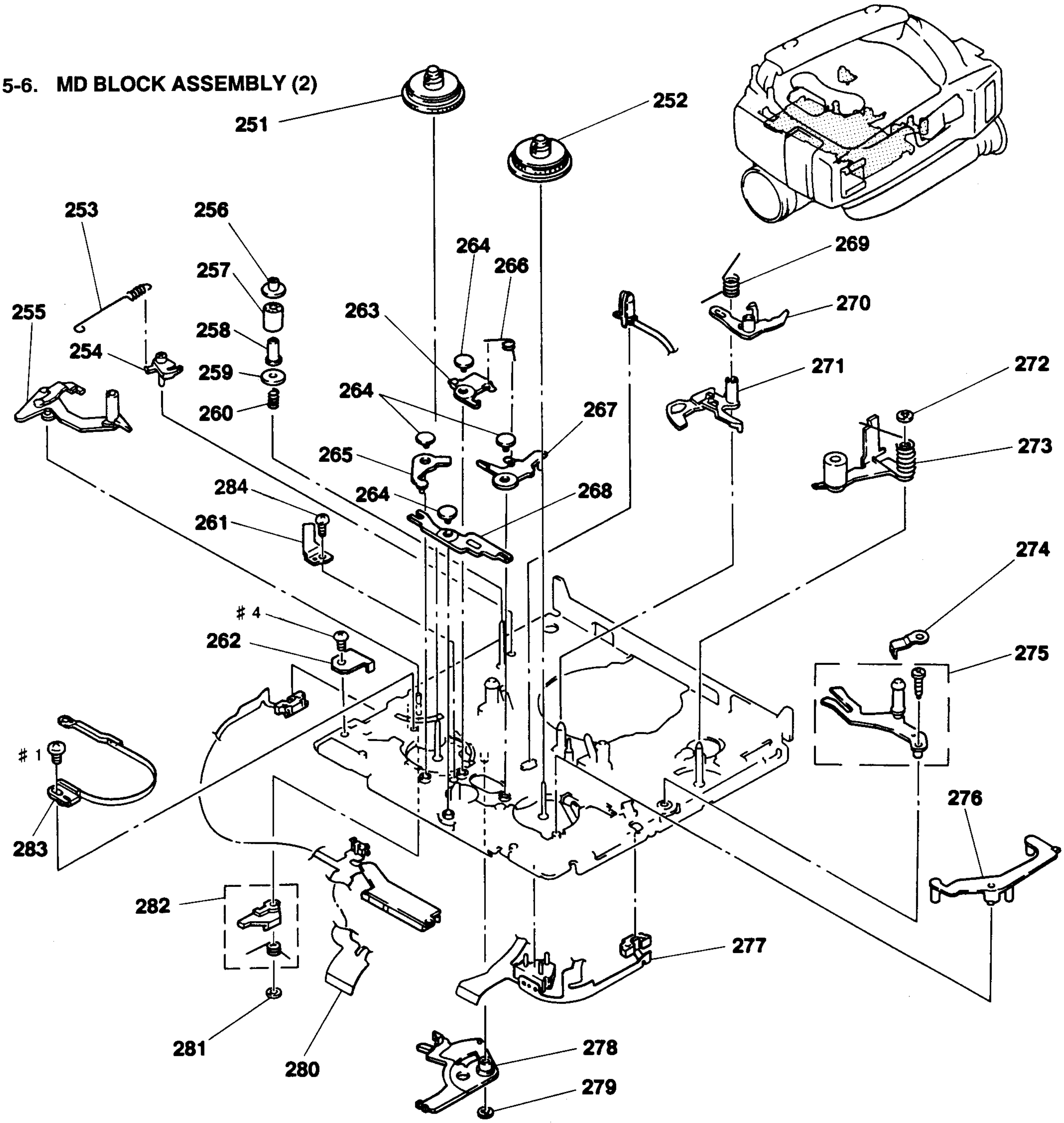
Ref. No.	Part No.	Description	Remark
201	X-3940-095-1	CASSETTE COMPARTMENT ASSY (N)	
202	3-728-825-03	SPRING, TENSION	
* 203	3-728-829-01	TAPE	
204	X-3726-836-3	DAMPER, OIL	
* 205	3-730-176-11	SHEET, MD	
206	3-728-868-01	GUARD, GUIDE	
207	X-3728-864-1	GROUND ASSY, SHAFT	
208	3-686-493-01	SCREW (M2X5), P1	

Ref. No.	Part No.	Description	Remark
209	A-7049-343-A	DRUM ASSY, UPPER, ROTARY (DGR-64-R)	
210	A-7040-207-A	ROLLER BLOCK ASSY, HC	
211	1-808-505-12	SENSOR, DEW CONDENSATION	
212	3-732-087-31	SCREW (M1.4X1.8), SPECIAL HEAD	
213	X-3786-482-5	BASE ASSY, DRUM	
M901	A-7048-405-A	DRUM ASSY (DGU-64A-R)	
M902	8-835-331-31	MOTOR, DC U-22A (CAPSTAN)	
M903	A-7040-208-A	MOTOR ASSY, THREADING (LOADING)	

5-6. MD BLOCK ASSEMBLY (2)



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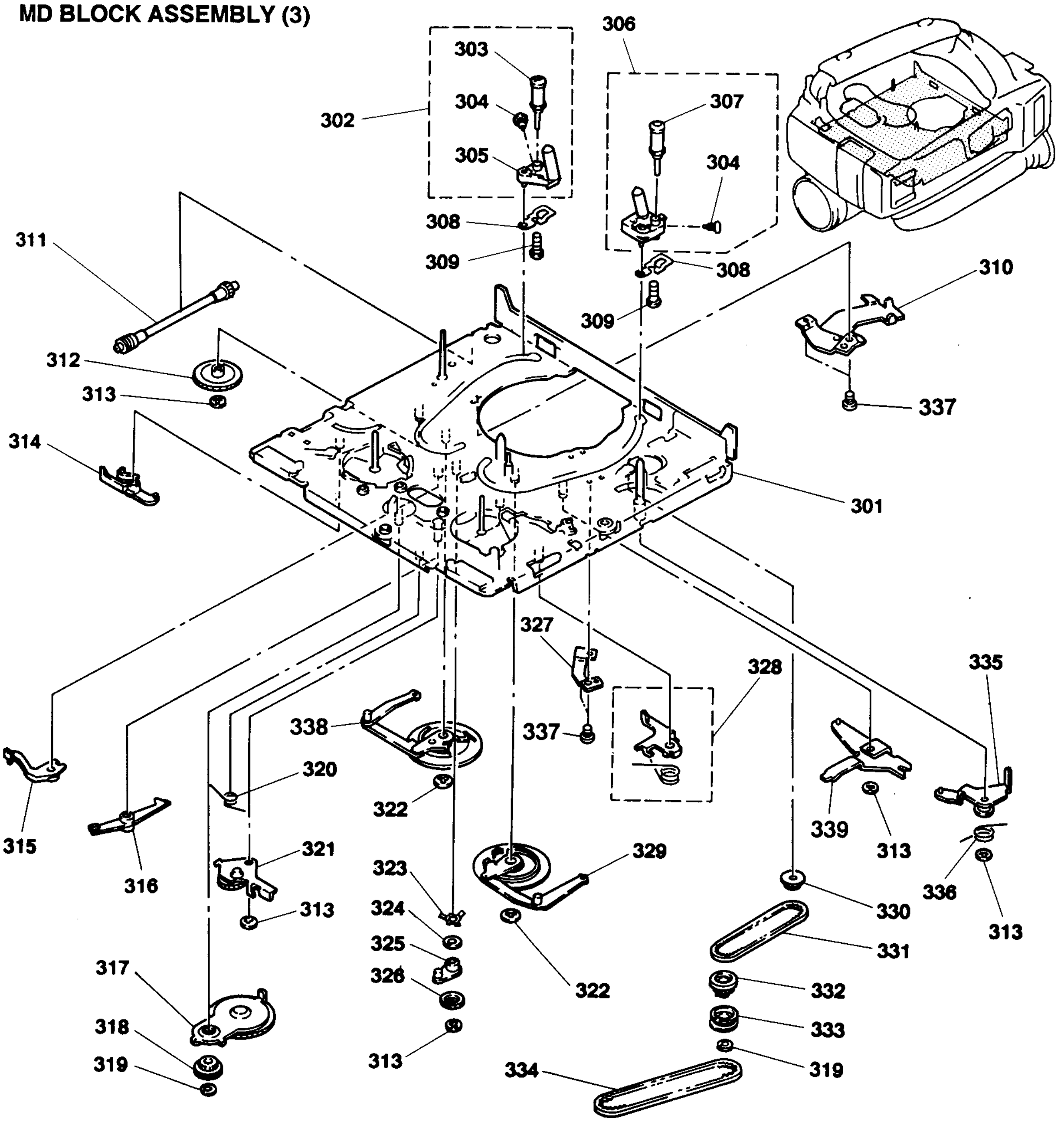
Ref. No.	Part No.	Description	Remark
251	X-3728-851-1	TABLE ASSY, REEL, S	
252	X-3728-855-6	TABLE ASSY, REEL, T	
253	3-736-414-01	SPRING, TENSION	
254	3-728-855-03	ARM, ADJUSTMENT	
255	X-3728-867-1	ARM ASSY (S), TENSION REGULATOR	
256	3-726-884-01	FLANGE, UPPER, TG2	
257	3-726-883-01	ROLLER, TG2	
258	3-726-885-01	SLEEVE, TG2	
259	3-726-882-02	FLANGE, LOWER, TG2	
260	3-726-886-01	SPRING, COMPRESSION	
261	3-726-848-01	RETAINER, TL	
262	3-730-125-01	RETAINER, SW	
263	3-728-849-01	BRAKE, S	
264	3-726-858-01	PIN, SHAFT RETAINER	
265	3-726-852-01	BRAKE, LB	
266	3-726-866-01	SPRING (ST), TORSION	
267	3-728-850-01	BRAKE, T	
268	3-726-853-01	LEVER, LB	
269	3-726-864-01	SPRING (RK), TORSION	
270	3-728-852-02	ARM, RK STOPPER	
271	3-728-875-01	STOPPER, RK	
272	3-669-465-00	WASHER (1.5), STOPPER	
273	A-7040-219-A	ARM BLOCK ASSY, PINCH	
274	3-728-808-01	SPRING, LEAF	
275	X-3728-869-1	ARM ASSY, TG7	
276	3-728-848-01	ARM, LB RELEASE	
277	1-628-061-12	PC BOARD, FP-90 FLEXIBLE	
278	X-3728-863-1	LEVER ASSY, SW	
279	3-726-829-01	WASHER, STOPPER	
280	1-628-060-12	PC BOARD, FP-89 FLEXIBLE	
281	3-321-393-11	WASHER, STOPPER	
282	X-3728-857-1	STOPPER ASSY, TENSION REGULATOR	
283	X-3728-859-1	BAND ASSY, TENSION REGULATOR	
284	3-732-087-31	SCREW (M1.4X1.8), SPECIAL HEAD	

5-7. MD BLOCK ASSEMBLY (3)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Ref. No.	Part No.	Description	Remark
301	X-3728-862-1	CHASSIS ASSY, MECHANICAL	
302	A-7040-128-A	COASTER (LEFT) BLOCK ASSY	
303	X-3726-820-1	ROLLER ASSY (U), GUIDE	
304	3-726-822-01	SCREW (M1.4X2) (STEP), HEAD	
305	X-3726-818-1	COASTER (LEFT) ASSY	
306	A-7040-216-A	COASTER (RIGHT)BLOCK ASSY(M1P)	
307	X-3728-808-4	ROLLER ASSY (U)(PLATING),GUIDE	
308	3-736-485-01	SPRING, LEAF, COSTER	
309	3-726-830-01	SCREW (M1.4X4) (THREE LOCK)	
310	X-3940-278-1	REINFORCEMENT (SS) ASSY	
311	X-3940-276-2	WORM ASSY	
312	3-744-109-01	GEAR, WHEEL	
313	3-726-829-01	WASHER, STOPPER	
314	3-728-842-01	LEVER, EJECT	
315	3-728-851-01	BRAKE, UL	
316	3-726-854-01	ARM, BRAKE RELEASE	
317	X-3728-866-1	GEAR ASSY, RK	
318	X-3728-858-2	GEAR ASSY, RC	
319	3-321-393-11	WASHER, STOPPER	
320	3-726-865-01	SPRING (LB), TORSION	
321	A-7040-225-A	GEAR BLOCK ASSY (N), LB	
322	3-669-465-00	WASHER (1.5), STOPPER	
323	3-726-867-01	SPRING, LEAF	
324	3-701-436-21	WASHER, POLYEHTHYLENE	
325	3-726-857-03	ARM, UL	
326	3-726-856-04	GEAR, UL	
* 327	3-726-805-01	REINFORCEMENT (TT)	
328	X-3726-808-3	BRAKE ASSY, TS	
329	X-3728-843-1	GEAR (RIGHT) ASSY, DRIVE	
330	X-3726-805-1	GEAR ASSY, JOINT	
331	3-728-866-11	BELT (S), TIMING	
332	X-3726-813-4	PULLEY (UPPER) ASSY, MIDWAY	
333	3-741-196-02	PULLEY (LOWER), BELT MIDWAY	
334	3-741-197-01	BELT (L), TIMING	
335	X-3940-279-1	ARM ASSY, PINCH SUB	
336	3-726-895-01	SPRING	
337	3-732-087-31	SCREW (M1.4X1.8), SPECIAL HEAD	
338	X-3728-842-1	GEAR (LEFT) ASSY, DRIVE	
339	3-941-322-01	LEVER, LOADING	

SECTION 6
ELECTRICAL PARTS LIST

AU-132

NOTE:

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- RESISTORS
  All resistors are in ohms
  METAL: Metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F : nonflammable
- Hardware (# mark) list is given in the last of this parts list.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- SEMICONDUCTORS
  In each case, u: μ , for example:
  uA...: μA..., uPA...: μPA...,
  uPB...: μPB..., uPC...: μPC...,
  uPD...: μPD...
- CAPACITORS
  uF : μF
- COILS
  uH : μH

Ref. No.	Part No.	Description			Remark
	A-7062-991-A	AU-132 BOARD, COMPLETE			
		**********************			
			(Ref. No 6,000 Series)		
		(CAPACITOR)			
C421	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C422	1-164-247-11	CERAMIC CHIP	0.047uF	10%	16V
C423	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C424	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C425	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C426	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C428	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C429	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C430	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C431	1-126-199-11	ELECT CHIP	6.8uF	20%	35V
C432	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C433	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C434	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C435	1-126-206-11	ELECT CHIP	100uF	20%	6.3V
C436	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C437	1-164-247-11	CERAMIC CHIP	0.047uF	10%	16V
C438	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C439	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C440	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C441	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C442	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C443	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C444	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C445	1-162-965-11	CERAMIC CHIP	0.0015uF	10%	50V
C446	1-163-016-00	CERAMIC CHIP	0.0039uF	10%	50V
C447	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C448	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C449	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C450	1-162-910-11	CERAMIC CHIP	5PF	0.25PF	50V
C451	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C452	1-162-910-11	CERAMIC CHIP	5PF	0.25PF	50V
C453	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C454	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C455	1-162-587-11	CERAMIC CHIP	0.039uF	10%	25V
C456	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C457	1-163-020-00	CERAMIC CHIP	0.0082uF	10%	50V
C458	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C459	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C460	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V

Ref. No.	Part No.	Description			Remark
C461	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C462	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C463	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C464	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C465	1-162-955-11	CERAMIC CHIP	150PF	5%	50V
C466	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C467	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C469	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C470	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C471	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
		(CONNECTOR)			
CN401	1-580-509-11	CONNECTOR, BOARD TO BOARD(P)14P			
* CN402	1-565-875-11	PIN, CONNECTOR (PC BOARD) 3P			
CN403	1-566-757-11	PIN, CONNECTOR (PC BOARD) 2P			
		(DIODE)			
D402	8-719-420-15	DIODE MA8082-M(TX)			
		(FILTER)			
FL401	1-236-145-11	FILTER, BAND PASS			
		(IC)			
IC401	8-752-033-01	IC CXA1237AR			
		(COIL)			
L401	1-412-032-11	INDUCTOR CHIP	100uH		
L402	1-410-658-31	INDUCTOR CHIP	220uH		
		(TRANSISTOR)			
Q406	8-729-117-32	TRANSISTOR	2SC4177		
Q409	8-729-117-32	TRANSISTOR	2SC4177		
Q410	8-729-117-32	TRANSISTOR	2SC4177		
Q411	8-729-905-15	TRANSISTOR	DTC144WU		
Q412	8-729-905-09	TRANSISTOR	DTA144WU		
Q413	8-729-117-32	TRANSISTOR	2SC4177		
Q414	8-729-905-09	TRANSISTOR	DTA144WU		
Q415	8-729-142-91	TRANSISTOR	2SK853-T1K5		
Q416	8-729-117-32	TRANSISTOR	2SC4177		
Q417	8-729-420-24	TRANSISTOR	2SB1218A-QRS		
Q418	8-729-420-24	TRANSISTOR	2SB1218A-QRS		
Q419	8-729-117-32	TRANSISTOR	2SC4177		

(RESISTOR)

Ref. No.	Part No.	Description				Remark
R421	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R422	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R423	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R424	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R425	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R426	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R430	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R431	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R432	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R433	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R434	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R435	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R436	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R437	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R438	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R439	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R440	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R441	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R442	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R443	1-216-801-11	METAL CHIP	22	5%	1/16W	
R444	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R445	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R446	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R447	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R448	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R449	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R450	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R451	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R452	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R453	1-216-649-11	METAL CHIP	820	0.5%	1/10W	
R454	1-216-649-11	METAL CHIP	820	0.5%	1/10W	
R455	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R456	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R457	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R458	1-216-819-11	METAL CHIP	680	5%	1/16W	
R459	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R460	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R461	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R462	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R463	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R464	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R465	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R466	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R467	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R468	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R469	1-216-820-11	METAL CHIP	820	5%	1/16W	
R470	1-216-814-11	METAL CHIP	270	5%	1/16W	
R471	1-216-810-11	METAL CHIP	120	5%	1/16W	
R472	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R473	1-216-045-00	METAL CHIP	680	5%	1/10W	
R474	1-216-041-00	METAL CHIP	470	5%	1/10W	
R475	1-216-817-11	METAL CHIP	470	5%	1/16W	

(VARIABLE RESISTOR)

Ref. No.	Part No.	Description		Remark
RV401	1-238-090-11	RES, ADJ, CERMET	10K	
RV402	1-238-091-11	RES, ADJ, CERMET	22K	

****

* 1-636-544-11 CB-35P BOARD

****

(Ref. No 6,000 Series)

(CONNECTOR)

Ref. No.	Part No.	Description
CN971	1-568-335-11	CONNECTOR, BOARD TO BOARD 18P

****

A-7071-539-A CB-38P BOARD, COMPLETE

****

(CONNECTOR)

Ref. No.	Part No.	Description
CN961	1-568-326-11	CONNECTOR, BOARD TO BOARD 7P

****

A-7071-538-A CB-39P BOARD, COMPLETE

****

(CONNECTOR)

Ref. No.	Part No.	Description
CN963	1-568-327-11	CONNECTOR, BOARD TO BOARD 8P

****

* A-7062-624-A CC-52 (P) BOARD, COMPLETE

****

(Ref. No 7,000 Series)

1-569-346-11 CONNECTOR, FPC(TRANSLATION)10P

(CAPACITOR)

Ref. No.	Part No.	Description				Remark
C201	1-163-086-00	CERAMIC CHIP	3PF		50V	
C202	1-164-232-11	CERAMIC CHIP	0.01uF		50V	
C203	1-163-033-00	CERAMIC CHIP	0.022uF		50V	
C213	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C214	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V	
C290	1-164-634-11	CERAMIC CHIP	1uF		16V	
C291	1-164-634-11	CERAMIC CHIP	1uF		16V	
C292	1-164-634-11	CERAMIC CHIP	1uF		16V	

(CONNECTOR)

Ref. No.	Part No.	Description
CN211	1-566-545-41	CONNECTOR, FPC (NON ZIF) 13P
CN212	1-566-543-31	CONNECTOR, FPC (NON ZIF) 11P
CN217	1-569-286-11	CONNECTOR, CARD EDGE 5P

(FILTER)

Ref. No.	Part No.	Description
FL201	1-236-188-11	FILTER, BAND PASS

(COIL)

Ref. No.	Part No.	Description	
L203	1-412-029-11	INDUCTOR CHIP	10uH

(TRANSISTOR)

Ref. No.	Part No.	Description	Remark
Q201	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q202	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q203	8-729-120-28	TRANSISTOR 2SC1623-L5L6	

(RESISTOR)

Ref. No.	Part No.	Description	Remark
R201	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R202	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R203	1-216-077-00	METAL CHIP 15K 5% 1/10W	
R204	1-216-041-00	METAL CHIP 470 5% 1/10W	
R205	1-216-033-00	METAL CHIP 220 5% 1/10W	
R206	1-216-049-00	METAL CHIP 1K 5% 1/10W	
R207	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R208	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R209	1-216-065-00	METAL CHIP 4.7K 5% 1/10W	
R210	1-216-039-00	METAL CHIP 390 5% 1/10W	
R211	1-216-047-00	METAL CHIP 820 5% 1/10W	
R276	1-216-295-00	METAL CHIP 0 5% 1/10W	
R282	1-216-295-00	METAL CHIP 0 5% 1/10W	
R290	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R291	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R292	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R293	1-216-061-00	METAL CHIP 3.3K 5% 1/10W	
R296	1-216-041-00	METAL CHIP 470 5% 1/10W	

(FLAT CABLE)

Ref. No.	Part No.	Description	Remark
W213	1-636-495-11	FP312 FLEXIBLE BOARD	
W214	1-636-496-11	FP313 FLEXIBLE BOARD	

****

A-7071-537-A CD-75P BOARD, COMPLETE
****

(Ref. No 4,000 Series)

(CAPACITOR)

Ref. No.	Part No.	Description	Remark
C902	1-135-155-21	TANTALUM CHIP 4.7uF 10% 16V	
C903	1-135-159-21	TANTALUM CHIP 10uF 10% 20V	
C904	1-164-232-11	CERAMIC CHIP 0.01uF 50V	
C905	1-135-162-21	TANTALUM CHIP 33uF 20% 6.3V	
C906	1-135-148-21	TANTAL. CHIP 1.5uF 20% 16V	

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN301	1-580-509-11	CONNECTOR, BOARD TO BOARD (P) 14P	

(COIL)

Ref. No.	Part No.	Description	Remark
L901	1-412-032-11	INDUCTOR CHIP 100uH	

(TRANSISTOR)

Ref. No.	Part No.	Description	Remark
Q901	8-765-420-02	TRANSISTOR 2SK300-3	

(RESISTOR)

Ref. No.	Part No.	Description	Remark
R901	1-216-025-00	METAL CHIP 100 5% 1/10W	
R902	1-216-063-00	METAL CHIP 3.9K 5% 1/10W	
R903	1-216-105-00	METAL CHIP 220K 5% 1/10W	
R904	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R905	1-216-045-00	METAL CHIP 680 5% 1/10W	

****

* A-7071-354-A CF-22 (P) BOARD, COMPLETE
****

(Ref. No 8,000 Series)

(SWITCH)

Ref. No.	Part No.	Description	Remark
S766	1-572-499-11	SWITCH, TACTIL (FADER)	

****

* A-7071-356-A CF-23 (P) BOARD, COMPLETE
****

(Ref. No 7,000 Series)

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN757	1-568-323-11	CONNECTOR, BOARD TO BOARD 4P	
CN975	1-568-334-11	CONNECTOR, BOARD TO BOARD 16P	
* CN976	1-565-875-11	PIN, CONNECTOR (PC BOARD) 3P	
CN977	1-566-757-11	PIN, CONNECTOR (PC BOARD) 2P	
CN978	1-566-757-11	PIN, CONNECTOR (PC BOARD) 2P	

(DIODE)

Ref. No.	Part No.	Description	Remark
D751	8-719-110-03	DIODE RD7.5ES-B2	
D751	8-719-420-15	DIODE MA8082-M(TX)	
D751	8-719-420-14	DIODE MA8082-M	
D751	8-719-977-34	DIODE DTZ12	
D752	8-719-110-03	DIODE RD7.5ES-B2	
D752	8-719-420-15	DIODE MA8082-M(TX)	
D752	8-719-420-14	DIODE MA8082-M	
D752	8-719-977-34	DIODE DTZ12	
D755	8-719-420-41	DIODE MA123	

(RESISTOR)

Ref. No.	Part No.	Description	Remark
R930	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R931	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R932	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	
R933	1-216-057-00	METAL CHIP 2.2K 5% 1/10W	

(SWITCH)

Ref. No.	Part No.	Description	Remark
S756	1-572-288-11	SWITCH, PUSH (AUTO LOCK)	
S757	1-572-438-11	SWITCH, TACTIL (WHITE BALANCE)	
S758	1-572-438-11	SWITCH, TACTIL (BACK LIGHT)	
S759	1-572-438-11	SWITCH, TACTIL (FOCUS)	
S760	1-572-438-11	SWITCH, TACTIL (SHUTTER SPEED)	

(FLAT CABLE)

Ref. No.	Part No.	Description	Remark
W756	1-636-589-11	FP-353 BOARD	
W979	1-590-104-11	CABLE, FLAT (FFC-3)	

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CF-24 (P) CF-25 (P) DD-31 (P)

Ref. No.	Part No.	Description			Remark
*	A-7071-358-A	CF-24 (P) BOARD, COMPLETE ************************ (Ref. No 10,000 Series)			
		(CONNECTOR)			
CN771	1-573-054-11	CONNECTOR, BOARD TO BOARD(F)4P			
		(DIODE)			
D771	8-719-404-40	DIODE MA121			
		(SWITCH)			
S771	1-572-438-11	SWITCH, TACTIL (SUPERIMPOSE ON/OFF)			
S772	1-572-438-11	SWITCH, TACTIL (MEMORY)			
S773	1-572-438-11	SWITCH, TACTIL (COLOR/MODE)			
**					
*	A-7071-359-A	CF-25 (P) BOARD, COMPLETE ************************ (Ref. No 9,000 Series)			
		(CONNECTOR)			
CN769	1-566-538-11	CONNECTOR, FPC (NON ZIF) 6P			
		(DIODE)			
D768	8-719-400-18	DIODE MA152WK			
		(SWITCH)			
S768	1-572-438-11	SWITCH, TACTIL (+)			
S769	1-572-438-11	SWITCH, TACTIL (-)			
S770	1-572-497-11	SWITCH, SLIDE (EDIT)			
**					
	A-7062-627-A	DD-31 (P) BOARD, COMPLETE ************************ (Ref. No 3,000 Series)			
*	3-749-758-02	CASE (UPPER), SHIELD, DD			
*	3-749-759-02	CASE (LOWER), SHIELD, DD			
		(CAPACITOR)			
C101	1-126-157-11	ELECT	10uF	20%	16V
C102	1-127-556-11	ELECT(SOLID)	6.8uF	20%	16V
C103	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C106	1-126-163-11	ELECT	4.7uF	20%	50V
C108	1-126-163-11	ELECT	4.7uF	20%	50V
C109	1-126-162-11	ELECT	3.3uF	20%	50V
C110	1-126-157-11	ELECT	10uF	20%	16V
C111	1-126-157-11	ELECT	10uF	20%	16V
C112	1-128-078-11	ELECT	33uF	20%	10V
C113	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C114	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C115	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C116	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C117	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C118	1-126-157-11	ELECT	10uF	20%	16V
C119	1-127-556-11	ELECT(SOLID)	6.8uF	20%	16V
C120	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C121	1-127-558-11	ELECT(SOLID)	10uF	20%	10V
C122	1-126-162-11	ELECT	3.3uF	20%	50V
C123	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C124	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C125	1-163-017-00	CERAMIC CHIP	0.0047uF	5%	50V
C126	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C127	1-164-218-11	CERAMIC CHIP	180PF	0.25PF	50V
C128	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C129	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C130	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C131	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C132	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C136	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C137	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C139	1-164-182-11	CERAMIC CHIP	0.0033uF	10%	50V
C140	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C141	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C142	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C143	1-163-005-11	CERAMIC CHIP	470PF	10%	50V
		(CONNECTOR)			
* CN101	1-566-198-11	PIN, CONNECTOR (PC BOARD) 5P			
		(DIODE)			
D101	8-719-941-04	DIODE SB007-03CP			
D102	8-719-938-75	DIODE SB05-05CP			
D103	8-719-951-22	IC IMN10			
D104	8-719-941-04	DIODE SB007-03CP			
D105	8-719-981-59	DIODE FC805			
		(IC)			
IC101	8-759-500-42	IC MB3783PFV			
IC102	8-759-998-94	IC LM311D			
		(JACK)			
J101	1-537-309-11	TERMINAL BOARD (BATTERY)			
		(COIL)			
L101	1-410-337-11	INDUCTOR	1uH		
L102	1-410-337-11	INDUCTOR	1uH		
L103	1-410-337-11	INDUCTOR	1uH		
L104	1-424-104-11	COIL, CHOKE	10uH		
L105	1-424-105-11	COIL, CHOKE	22uH		

Ref. No.	Part No.	Description	Remark
L106	1-424-104-11	COIL, CHOKE 10uH	
L107	1-412-034-11	INDUCTOR CHIP 330uH	
L108	1-412-034-11	INDUCTOR CHIP 330uH	
L109	1-412-034-11	INDUCTOR CHIP 330uH	
L110	1-424-104-11	COIL, CHOKE 10uH	
L111	1-424-106-11	COIL, CHOKE 47uH	
L112	1-424-105-11	COIL, CHOKE 22uH	
L113	1-424-104-11	COIL, CHOKE 10uH	
L114	1-424-105-11	COIL, CHOKE 22uH	
L115	1-412-030-11	INDUCTOR CHIP 22uH	
L116	1-412-027-11	INDUCTOR CHIP 2.2uH	
L117	1-410-337-11	INDUCTOR 1uH	

(IC LINK)

Ref. No.	Part No.	Description	Remark
⚠PS101	1-532-841-21	LINK, IC	
⚠PS102	1-532-841-21	LINK, IC	
⚠PS103	1-532-841-21	LINK, IC	

(TRANSISTOR)

Ref. No.	Part No.	Description	Remark
Q101	8-729-421-90	TRANSISTOR XN4113	
Q102	8-729-805-25	TRANSISTOR 2SB1121	
Q103	8-729-822-82	TRANSISTOR 2SK1311	
Q104	8-729-119-83	TRANSISTOR 2SC4175-B3	
Q105	8-729-805-25	TRANSISTOR 2SB1121	
Q106	8-729-805-25	TRANSISTOR 2SB1121	
Q107	8-729-805-25	TRANSISTOR 2SB1121	
Q108	8-729-905-12	TRANSISTOR DTA144EU	

(RESISTOR)

Ref. No.	Part No.	Description				Remark
R101	1-216-033-00	METAL CHIP	220	5%	1/10W	
R102	1-216-019-00	METAL CHIP	56	5%	1/10W	
R103	1-216-009-00	METAL CHIP	22	5%	1/10W	
R104	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R105	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R106	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R107	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R108	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R109	1-216-045-00	METAL CHIP	680	5%	1/10W	
R110	1-216-061-00	METAL CHIP	3.3K	5%	1/10W	
R111	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R112	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R113	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R114	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R115	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R116	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R117	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R118	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R119	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R120	1-216-057-00	METAL CHIP	2.2K	5%	1/10W	
R121	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R122	1-216-081-00	METAL CHIP	22K	5%	1/10W	
R123	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R124	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R126	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R127	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R128	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R129	1-216-019-00	METAL CHIP	56	5%	1/10W	
R130	1-216-023-00	METAL CHIP	82	5%	1/10W	
R131	1-216-025-00	METAL CHIP	100	5%	1/10W	
R132	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R133	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R134	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R135	1-216-102-00	METAL GLAZE	160K	5%	1/10W	
R136	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R137	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R138	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R139	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R140	1-216-841-11	METAL CHIP	47K	5%	1/16W	

(VARIABLE RESISTOR)

Ref. No.	Part No.	Description	Remark
RV101	1-230-526-11	RES, ADJ, METAL 47K	
RV102	1-238-087-11	RES, ADJ, CERMET 1K	
RV103	1-238-087-11	RES, ADJ, CERMET 1K	
RV104	1-238-087-11	RES, ADJ, CERMET 1K	
RV105	1-238-089-11	RES, ADJ, CERMET 4.7K	

****

* A-7071-349-A EJ-20 (P) BOARD, COMPLETE
****
(Ref. No 1,000 Series)

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN915	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P	

(SWITCH)

Ref. No.	Part No.	Description	Remark
S915	1-572-498-11	SWITCH, SLIDE (EJECT)	

****

* A-7071-350-A FK-41 (P) BOARD, COMPLETE
****
(AEP, UK model)

* A-7071-391-A FK-41 (P) BAORD, COMPLETE
****
(E, Australian model)
(Ref. No 9,000 Series)

* 3-749-906-01 INSULATOR, VTR BUTTON

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
CN902	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P	
CN903	1-566-543-31	CONNECTOR, FPC (NON ZIF) 11P	
* CN904	1-565-875-11	PIN, CONNECTOR (PC BOARD) 3P	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

FK-41 (P) | FP-89 FREXIBLE | FP-90 FREXIBLE | JC-10 (P) | LD-54 (P)

Ref. No.	Part No.	Description	Remark
CN905	1-565-874-11	PIN, CONNECTOR (PC BOARD) 2P	
		(SWITCH)	
S901	1-572-283-11	SWITCH, SLIDE (POWER)	
S902	1-572-438-11	SWITCH, TACTIL (REW ◀◀)	
S903	1-572-438-11	SWITCH, TACTIL (PB ▷)	
S904	1-572-438-11	SWITCH, TACTIL (FF ▶▶)	
S905	1-572-438-11	SWITCH, TACTIL (STOP □)	
S906	1-572-438-11	SWITCH, TACTIL (PAUSE ▯▯)	
S907	1-572-498-21	SWITCH, SLIDE (REC •—) (E, Australian model)	
		(FLAT CABLE)	
W901	1-636-500-11	FP319 FLEXIBLE BOARD	
**			
*	1-628-060-12	FP-89 FLEXIBLE BOARD ********************	(Ref. No 11,000 Series)
	3-728-859-02	HOLDER, SENSOR	
		(DIODE)	
D991	8-719-820-44	PHOTO COUPLER TLP907	
		(TRANSISTOR)	
Q991	8-729-906-48	TRANSISTOR EE-TP109	
		(SWITCH)	
S991	1-571-099-11	SWITCH (CASSETTE DOWN)	
S993	1-572-173-11	SWITCH, SLIDE (ENCODER)(MODE)	
**			
*	1-628-061-12	FP-90 FLEXIBLE BOARD ********************	(Ref. No 12,000 Series)
	3-728-837-01	HOLDER, LED	
	3-728-869-02	HOLDER, SENSOR	
		(DIODE)	
D992	8-719-940-81	DIODE GL452S	
D993	8-719-820-44	PHOTO COUPLER TLP907	
		(TRANSISTOR)	
Q992	8-729-906-48	TRANSISTOR EE-TP109	
		(SWITCH)	
S992	1-572-298-11	SWITCH, PUSH (REC PROOF, TAPE SELECT)	
**			

Ref. No.	Part No.	Description	Remark
*	A-7071-360-A	JC-10 (P) BOARD, COMPLETE **************************	(Ref. No 1,000 Series)
		(CONNECTOR)	
CN971	1-568-335-11	CONNECTOR, BOARD TO BOARD 18P	
		(FLAT CABLE)	
W972	1-590-108-11	CABLE, FLAT (FFC-7)	
W974	1-590-107-11	CABLE, FLAT (FFC-6)	
**			
	A-7062-994-A	LD-54P BOARD, COMPLETE **********************	(Ref. No 3,000 Series)
		(CAPACITOR)	
C701	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C702	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C703	1-162-968-11	CERAMIC CHIP 0.0047uF 10% 50V	
C706	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C707	1-135-181-21	TANTALUM CHIP 4.7uF 20% 6.3V	
C708	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C709	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C710	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C711	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C713	1-163-809-11	CERAMIC CHIP 0.047uF 10% 25V	
C714	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C715	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C716	1-162-637-11	CERAMIC CHIP 0.47uF 16V	
		(CONNECTOR)	
CN702	1-566-540-11	CONNECTOR, FPC (NON ZIF) 8P	
* CN703	1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P	
* CN704	1-565-543-21	PIN, CONNECTOR (PC BOARD) 4P	
* CN705	1-565-542-11	PIN, CONNECTOR (PC BOARD) 3P	
		(DIODE)	
D701	8-719-404-46	DIODE MA110-TX	
		(IC)	
IC701	8-759-037-20	IC MPC1737M	
IC702	8-759-100-94	IC uPC358G2	
IC703	8-759-981-82	IC RC3414M	
		(TRANSISTOR)	
Q701	8-729-905-15	TRANSISTOR DTC144WU	
Q702	8-729-920-39	TRANSISTOR IMT-1US	
Q703	8-729-905-61	TRANSISTOR DTC124EU	
Q704	8-729-905-23	TRANSISTOR 2SA1576-R	
Q706	8-729-106-60	TRANSISTOR 2SB1115A	

Ref. No.	Part No.	Description				Remark
Q707	8-729-117-32	TRANSISTOR	2SC4177			

(RESISTOR)

Ref. No.	Part No.	Description				Remark
R701	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R702	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R703	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R705	1-216-817-11	METAL CHIP	470	5%	1/16W	
R707	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R708	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R709	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R710	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R712	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R714	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R715	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R716	1-216-309-00	METAL CHIP	5.6	5%	1/10W	
R717	1-216-791-11	METAL CHIP	3.3	5%	1/16W	
R718	1-216-791-11	METAL CHIP	3.3	5%	1/16W	
R719	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R720	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R723	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R725	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R726	1-216-819-11	METAL CHIP	680	5%	1/16W	
R730	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R732	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R733	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R734	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R735	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R736	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R737	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R738	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R739	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R740	1-216-843-11	METAL CHIP	68K	5%	1/16W	

(VARIABLE RESISTOR)

Ref. No.	Part No.	Description	Remark
RV701	1-238-094-11	RES, ADJ CERMET 220K	

(FLAT CABLE)

Ref. No.	Part No.	Description	Remark
W701	1-630-595-21	FP-187 FLEXIBLE BOARD	

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A-7071-536-A MA-135 BOARD, COMPLETE

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(Ref. No 5,000 Series)

(CAPACITOR)

Ref. No.	Part No.	Description				Remark
C401	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C402	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C403	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C404	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C406	1-162-587-11	CERAMIC CHIP	0.039uF	10%	25V	
C407	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C408	1-164-156-11	CERAMIC CHIP	0.1uF		25V	
C409	1-124-967-11	ELECT	10uF	20%	10V	
C410	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C411	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C412	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V	
C413	1-126-205-11	ELECT CHIP	47uF	20%	6.3V	
C414	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C415	1-162-957-11	CERAMIC CHIP	220PF	5%	50V	
C416	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V	

(CONNECTOR)

Ref. No.	Part No.	Description	Remark
* CN404	1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P	

(DIODE)

Ref. No.	Part No.	Description		Remark
D401	8-719-420-15	DIODE	MA8082-M(TX)	

(JACK)

Ref. No.	Part No.	Description	Remark
J904	1-568-027-11	JACK, SMALL TYPE 1P (MIC)	

(TRANSISTOR)

Ref. No.	Part No.	Description		Remark
Q402	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q403	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q404	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q405	8-729-120-28	TRANSISTOR	2SC1623-L5L6	
Q481	8-729-120-28	TRANSISTOR	2SC1623-L5L6	

(RESISTOR)

Ref. No.	Part No.	Description				Remark
R401	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R402	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R403	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R404	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R405	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R406	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R407	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R408	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R409	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R410	1-216-810-11	METAL CHIP	120	5%	1/16W	
R411	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R412	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R413	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R414	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R415	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R416	1-216-815-11	METAL CHIP	330	5%	1/16W	
R417	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R418	1-216-295-00	METAL CHIP	0	5%	1/10W	
R419	1-216-295-00	METAL CHIP	0	5%	1/10W	
R485	1-216-864-11	METAL CHIP	0	5%	1/16W	

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Ref. No.	Part No.	Description	Remark
	A-7063-119-A	RM-57P BOARD, COMPLETE	
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		(Ref. No 13,000 Series)	
		(CAPACITOR)	
C101	1-135-259-11	TANTAL. CHIP 10uF 20% 6.3V	
C102	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C103	1-135-166-21	TANTALUM CHIP 47uF 10% 10V	
C104	1-163-033-00	CERAMIC CHIP 0.022uF 50V	
C105	1-163-038-00	CERAMIC CHIP 0.1uF 25V	
C106	1-135-155-21	TANTALUM CHIP 4.7uF 10% 16V	
		(CONNECTOR)	
CN101	1-566-521-11	CONNECTOR, FPC (ZIF) 5P	
		(DIODE)	
D101	8-719-104-34	DIODE 1S2836	
		(IC)	
IC101	8-741-100-63	IC SBX1619-51	
IC102	8-759-043-91	IC uPD75104GF-784-3BE	
IC103	8-759-946-03	IC S-8054ALR-LN-S	
IC104	8-759-937-54	IC S-81250HG-RD-S	
		(COIL)	
L101	1-412-029-11	INDUCTOR CHIP 10uH	
		(TRANSISTOR)	
Q101	8-729-901-01	TRANSISTOR DTC144EK	
Q102	8-729-901-01	TRANSISTOR DTC144EK	
		(RESISTOR)	
R101	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R102	1-216-073-00	METAL CHIP 10K 5% 1/10W	
R103	1-216-035-00	METAL CHIP 270 5% 1/10W	
R104	1-216-089-00	METAL CHIP 47K 5% 1/10W	
R105	1-216-085-00	METAL CHIP 33K 5% 1/10W	
R106	1-216-017-00	METAL CHIP 47 5% 1/10W	
		(SWITCH)	
S101	1-572-497-11	SWITCH, SLIDE (REMOCON ON/OFF)	
		(VIBRATOR)	
X101	1-567-152-00	VIBRATOR, CERAMIC 4MHz	
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*	A-7071-362-A	SW-158 (P) BOARD, COMPLETE	
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		(Ref. No 5,000 Series)	

Ref. No.	Part No.	Description	Remark
		(CAPACITOR)	
C942	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C943	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C944	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
C945	1-163-009-11	CERAMIC CHIP 0.001uF 10% 50V	
		(DIODE)	
D941	8-719-420-15	DIODE MA8082-M(TX)	
D942	8-719-106-71	DIODE RD12M-B2	
D943	8-719-400-18	DIODE MA152WK	
D944	8-719-420-15	DIODE MA8082-M(TX)	
D945	8-719-420-15	DIODE MA8082-M(TX)	
		(JACK)	
J941	1-565-276-21	JACK, ULTRA SMALL 1P (REMOTE)	
J942	1-568-027-11	JACK, SMALL TYPE 1P (HEADPHONE)	
		(COIL)	
L941	1-410-369-11	INDUCTOR CHIP 1uH	
L942	1-410-369-11	INDUCTOR CHIP 1uH	
L943	1-410-369-11	INDUCTOR CHIP 1uH	
L944	1-410-369-11	INDUCTOR CHIP 1uH	
L945	1-410-369-11	INDUCTOR CHIP 1uH	
		(SWITCH)	
S921	1-553-977-00	SWITCH, SLIDE (LOCK/STANDBY)	
S922	1-571-315-11	SWITCH, KEY BOARD (START/STOP)	
		(FLAT CABLE)	
W941	1-590-102-11	CABLE, FLAT (FFC-1)	
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	A-7062-995-A	TI-41P BOARD, COMPLETE	
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		(Ref. No 4,000 Series)	
		(CAPACITOR)	
C801	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C802	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C803	1-162-637-11	CERAMIC CHIP 0.47uF 16V	
C804	1-162-913-11	CERAMIC CHIP 8PF 0.5PF 50V	
C805	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C807	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C808	1-162-964-11	CERAMIC CHIP 0.001uF 10% 50V	
C810	1-135-157-21	TANTALUM CHIP 10uF 20% 6.3V	
C811	1-164-156-11	CERAMIC CHIP 0.1uF 25V	
C812	1-162-970-11	CERAMIC CHIP 0.01uF 10% 25V	
C813	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C814	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C815	1-162-949-11	CERAMIC CHIP 47PF 5% 50V	
C816	1-164-156-11	CERAMIC CHIP 0.1uF 25V	

Ref. No.	Part No.	Description			Remark
C817	1-162-975-11	CERAMIC CHIP	24PF	5%	50V
C819	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
		(CONNECTOR)			
CN801	1-580-512-11	CONNECTOR, BOARD TO BOARD(P)20P			
		(TRIMMER)			
CT801	1-141-331-11	CAP, CHIP TRIMMER			
CT802	1-141-331-11	CAP, CHIP TRIMMER			
		(DIODE)			
D801	8-713-300-88	DIODE 1T33C-01			
		(IC)			
IC801	8-759-507-53	IC MS6264CLL-15FC			
IC802	8-759-150-75	IC uPD6145G-621			
IC803	8-759-983-54	IC MB87485			
		(COIL)			
L801	1-410-377-31	INDUCTOR CHIP	4.7uH		
L802	1-410-384-31	INDUCTOR CHIP	18uH		
L803	1-410-390-11	INDUCTOR CHIP	56uH		
L804	1-410-381-11	INDUCTOR CHIP	10uH		
		(TRANSISTOR)			
Q801	8-729-905-18	TRANSISTOR DTC144EU			
Q802	8-729-403-24	TRANSISTOR XN4210			
		(RESISTOR)			
R801	1-216-833-11	METAL CHIP	10K	5%	1/16W
R805	1-216-833-11	METAL CHIP	10K	5%	1/16W
R806	1-216-833-11	METAL CHIP	10K	5%	1/16W
R809	1-216-833-11	METAL CHIP	10K	5%	1/16W
R810	1-216-833-11	METAL CHIP	10K	5%	1/16W
R811	1-216-833-11	METAL CHIP	10K	5%	1/16W
R812	1-216-833-11	METAL CHIP	10K	5%	1/16W
R815	1-216-833-11	METAL CHIP	10K	5%	1/16W
R816	1-216-833-11	METAL CHIP	10K	5%	1/16W
R818	1-216-837-11	METAL CHIP	22K	5%	1/16W
R819	1-216-829-11	METAL CHIP	4.7K	5%	1/16W
R820	1-216-845-11	METAL CHIP	100K	5%	1/16W
R821	1-216-845-11	METAL CHIP	100K	5%	1/16W
R822	1-216-833-11	METAL CHIP	10K	5%	1/16W
R823	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R826	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R827	1-216-821-11	METAL CHIP	1K	5%	1/16W
R828	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R829	1-216-825-11	METAL CHIP	2.2K	5%	1/16W
R830	1-216-817-11	METAL CHIP	470	5%	1/16W
R831	1-216-817-11	METAL CHIP	470	5%	1/16W
R832	1-216-833-11	METAL CHIP	10K	5%	1/16W
		(CONPOSITION CIRCUIT BLOCK)			
RB801	1-236-424-11	NETWORK, RES 10K			
RB802	1-236-424-11	NETWORK, RES 10K			
RB804	1-236-424-11	NETWORK, RES 10K			
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	A-7062-993-A	VC-117 BOARD, COMPLETE **********************			
					(Ref. No 1,000 Series)
*	3-940-303-01	SHEET, REINFORCEMENT, CB32			
		(CAPACITOR)			
C101	1-135-211-11	TANTAL. CHIP	6.8uF	20%	6.3V
C102	1-135-162-21	TANTALUM CHIP	33uF	20%	6.3V
C103	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C104	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C105	1-135-162-21	TANTALUM CHIP	33uF	20%	6.3V
C108	1-126-607-11	ELECT CHIP	47uF	20%	4V
C109	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C112	1-162-910-11	CERAMIC CHIP	5PF	0.25PF	50V
C131	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C132	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C133	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C134	1-135-079-21	TANTALUM CHIP	3.3uF	10%	35V
C136	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C137	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C138	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C141	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C142	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C143	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C145	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C149	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C151	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C152	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C153	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C154	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C158	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C180	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C181	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C182	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C183	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C184	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C185	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C186	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C187	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C188	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C189	1-164-156-11	CERAMIC CHIP	0.1uF		25V

VC-117

Ref. No.	Part No.	Description			Remark
C191	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C192	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C196	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C197	1-162-922-11	CERAMIC CHIP	39PF	5%	50V
C198	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C199	1-162-925-11	CERAMIC CHIP	68PF	5%	50V
C200	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C201	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C202	1-162-638-11	CERAMIC CHIP	1uF		16V
C203	1-162-638-11	CERAMIC CHIP	1uF		16V
C204	1-162-638-11	CERAMIC CHIP	1uF		16V
C205	1-162-638-11	CERAMIC CHIP	1uF		16V
C206	1-162-638-11	CERAMIC CHIP	1uF		16V
C210	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C211	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C212	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C213	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C214	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C215	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C216	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C217	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C219	1-162-638-11	CERAMIC CHIP	1uF		16V
C220	1-162-638-11	CERAMIC CHIP	1uF		16V
C221	1-162-638-11	CERAMIC CHIP	1uF		16V
C222	1-162-638-11	CERAMIC CHIP	1uF		16V
C223	1-162-638-11	CERAMIC CHIP	1uF		16V
C224	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C225	1-162-638-11	CERAMIC CHIP	1uF		16V
C229	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C230	1-135-211-11	TANTAL. CHIP	6.8uF	20%	6.3V
C232	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C233	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C234	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C235	1-135-211-11	TANTAL. CHIP	6.8uF	20%	6.3V
C236	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C237	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C238	1-163-253-11	CERAMIC CHIP	120PF	5%	50V
C239	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C241	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C252	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C253	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C254	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C255	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C256	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C261	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C262	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C265	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C266	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C267	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C268	1-162-638-11	CERAMIC CHIP	1uF		16V

Ref. No.	Part No.	Description			Remark
C269	1-162-638-11	CERAMIC CHIP	1uF		16V
C272	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C273	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C274	1-162-925-11	CERAMIC CHIP	68PF	5%	50V
C275	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C276	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C277	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C279	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C280	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C281	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C282	1-162-925-11	CERAMIC CHIP	68PF	5%	50V
C283	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C301	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C304	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C305	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C306	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C307	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C308	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C309	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C310	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C311	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C313	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C315	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C316	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C317	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C318	1-126-205-11	ELECT CHIP	47uF	20%	6.3V
C320	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C321	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C322	1-162-638-11	CERAMIC CHIP	1uF		16V
C323	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C331	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C332	1-162-919-11	CERAMIC CHIP	22PF	5%	50V
C333	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C334	1-162-638-11	CERAMIC CHIP	1uF		16V
C336	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C337	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C342	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C343	1-164-337-11	CERAMIC CHIP	2.2uF		16V
C344	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C346	1-162-922-11	CERAMIC CHIP	39PF	5%	50V
C348	1-163-097-00	CERAMIC CHIP	15PF	5%	50V
C349	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C360	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C362	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C363	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C364	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C365	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C366	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C367	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C368	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V

Ref. No.	Part No.	Description			Remark
C369	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C370	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C371	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C372	1-135-072-21	TANTALUM CHIP	0.22uF	10%	35V
C373	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C374	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C378	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C379	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V
C380	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C389	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C415	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C416	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C561	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C562	1-164-160-11	CERAMIC CHIP	20PF	5%	50V
C563	1-162-638-11	CERAMIC CHIP	1uF		16V
C564	1-162-915-11	CERAMIC CHIP	10PF	0.5PF	50V
C565	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C566	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C567	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C569	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C570	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C571	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C572	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C611	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C612	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C613	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C614	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C616	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C617	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C618	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C619	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C620	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C621	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C623	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C624	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C625	1-162-928-11	CERAMIC CHIP	120PF	5%	50V
C626	1-162-926-11	CERAMIC CHIP	82PF	5%	50V
C627	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C628	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C629	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C631	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C633	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C634	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C636	1-164-005-11	CERAMIC CHIP	0.47uF		25V
C637	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C638	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C643	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C644	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C647	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C648	1-128-292-11	ELECT	220uF	20%	10V

Ref. No.	Part No.	Description	Remark
		(CONNECTOR)	
CN302	1-580-496-11	CONNECTOR, BOARD TO BOARD(R)14P	
* CN304	1-565-543-11	PIN, CONNECTOR (PC BOARD) 4P	
CN802	1-568-366-41	CONNECTOR, BOARD TO BOARD 16P	
CN803	1-580-499-11	CONNECTOR, BOARD TO BOARD(R) 20P	
CN804	1-568-366-41	CONNECTOR, BOARD TO BOARD 16P	
CN805	1-568-359-41	CONNECTOR, BOARD TO BOARD 20P	
CN806	1-568-367-41	CONNECTOR, BOARD TO BOARD 18P	
		(TRIMMER)	
CT141	1-141-331-11	CAP, CHIP TRIMMER	
CT142	1-141-331-11	CAP, CHIP TRIMMER	
CT143	1-141-356-11	CAP, ADJ	
		(DIODE)	
D101	8-719-404-46	DIODE MA110-TX	
D102	8-719-404-46	DIODE MA110-TX	
D131	8-719-820-05	DIODE 1SS181	
D132	8-719-404-46	DIODE MA110-TX	
D141	8-719-949-46	DIODE 1T32	
D142	8-719-949-46	DIODE 1T32	
D301	8-719-404-46	DIODE MA110-TX	
D361	8-719-820-05	DIODE 1SS181	
D362	8-719-404-46	DIODE MA110-TX	
D561	8-719-404-49	DIODE MA111-TX	
D562	8-719-420-51	DIODE MA729-TX	
D563	8-719-404-46	DIODE MA110-TX	
		(FILTER)	
FL181	1-236-266-11	FILTER, LOW PASS (YH)	
FL182	1-236-267-11	FILTER, LOW PASS (YDL)	
FL303	1-415-695-11	DL, LC	
FL610	1-239-111-21	FILTER, LOW PASS	
		(IC)	
IC141	8-752-335-85	IC CXD2109Q	
IC181	8-752-034-17	IC CXA1338R	
IC182	8-752-330-15	IC CXL1503N	
IC183	8-752-332-69	IC CXL5504M	
IC251	8-752-034-21	IC CXA1339R	
IC252	8-759-946-00	IC MB88341PFV	
IC253	8-752-039-49	IC CXA1393AN	
IC301	8-752-033-34	IC CXA1072R	
IC302	8-759-064-35	IC MB88346BPFV-EF	
IC361	8-759-037-60	IC MC68HC05N4-SC406667	
IC362	8-759-937-56	IC S-8054ALB-LM-S	
IC363	8-759-008-67	IC MC14066BF	
IC364	8-759-998-96	IC LM324D	

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Ref. No.	Part No.	Description	Remark
IC561	8-759-154-07	IC uPD7503GF-J59-3B8	
IC610	8-752-334-49	IC CXD1172AM	
IC611	8-759-521-09	IC MB88346APFV-EF	
IC612	8-752-326-18	IC CXD1204R	
IC613	8-759-038-59	IC MC68HC05C4-SC403112	
IC615	8-759-998-98	IC LM358D	
		(COIL)	
L101	1-412-029-11	INDUCTOR CHIP 10uH	
L102	1-412-031-11	INDUCTOR CHIP 47uH	
L141	1-410-391-11	INDUCTOR CHIP 68uH	
L142	1-410-381-11	INDUCTOR CHIP 10uH	
L182	1-412-029-11	INDUCTOR CHIP 10uH	
L183	1-410-381-11	INDUCTOR CHIP 10uH	
L251	1-410-381-11	INDUCTOR CHIP 10uH	
L303	1-410-204-31	INDUCTOR CHIP 10uH	
L304	1-410-392-11	INDUCTOR CHIP 82uH	
L401	1-410-192-51	INDUCTOR CHIP 1uH	
L402	1-410-192-51	INDUCTOR CHIP 1uH	
L403	1-412-026-11	INDUCTOR CHIP 1uH	
L404	1-410-192-51	INDUCTOR CHIP 1uH	
L561	1-410-369-11	INDUCTOR CHIP 1uH	
L610	1-410-381-11	INDUCTOR CHIP 10uH	
L611	1-410-389-31	INDUCTOR CHIP 47uH	
L612	1-410-655-31	INDUCTOR CHIP 120uH	
		(TRANSISTOR)	
Q101	8-729-907-46	TRANSISTOR IMZ1	
Q102	8-729-907-46	TRANSISTOR IMZ1	
Q106	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q107	8-729-907-46	TRANSISTOR IMZ1	
Q111	8-729-907-46	TRANSISTOR IMZ1	
Q112	8-729-907-46	TRANSISTOR IMZ1	
Q113	8-729-921-58	TRANSISTOR DTA144TU	
Q131	8-729-402-13	TRANSISTOR XN1501-TX	
Q132	8-729-117-32	TRANSISTOR 2SC4177	
Q135	8-729-902-96	TRANSISTOR FMS1	
Q141	8-729-117-32	TRANSISTOR 2SC4177	
Q142	8-729-117-32	TRANSISTOR 2SC4177	
Q181	8-729-117-32	TRANSISTOR 2SC4177	
Q182	8-729-925-42	TRANSISTOR IMT2	
Q183	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q184	8-729-117-32	TRANSISTOR 2SC4177	
Q185	8-729-402-13	TRANSISTOR XN1501-TX	
Q186	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q187	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q188	8-729-117-32	TRANSISTOR 2SC4177	
Q189	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q190	8-729-117-32	TRANSISTOR 2SC4177	
Q191	8-729-925-42	TRANSISTOR IMT2	
Q192	8-729-925-42	TRANSISTOR IMT2	
Q193	8-729-925-42	TRANSISTOR IMT2	
Q194	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q195	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q196	8-729-117-32	TRANSISTOR 2SC4177	
Q255	8-729-907-46	TRANSISTOR IMZ1	
Q256	8-729-905-18	TRANSISTOR DTC144EU	
Q257	8-729-907-46	TRANSISTOR IMZ1	
Q302	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q303	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q305	8-729-117-32	TRANSISTOR 2SC4177	
Q310	8-729-117-32	TRANSISTOR 2SC4177	
Q311	8-729-117-32	TRANSISTOR 2SC4177	
Q312	8-729-117-32	TRANSISTOR 2SC4177	
Q313	8-729-902-96	TRANSISTOR FMS1	
Q314	8-729-907-46	TRANSISTOR IMZ1	
Q315	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q361	8-729-403-07	TRANSISTOR XN1213	
Q362	8-729-403-10	TRANSISTOR XN6215	
Q363	8-729-117-32	TRANSISTOR 2SC4177	
Q364	8-729-403-10	TRANSISTOR XN6215	
Q365	8-729-925-42	TRANSISTOR IMT2	
Q367	8-729-117-32	TRANSISTOR 2SC4177	
Q368	8-729-403-10	TRANSISTOR XN6215	
Q561	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q562	8-729-403-24	TRANSISTOR XN4210	
Q563	8-729-905-18	TRANSISTOR DTC144EU	
Q564	8-729-921-08	TRANSISTOR DTC144TU	
Q565	8-729-925-42	TRANSISTOR IMT2	
Q566	8-729-402-19	TRANSISTOR XN6501	
Q567	8-729-925-42	TRANSISTOR IMT2	
Q568	8-729-109-44	TRANSISTOR 2SK94	
Q569	8-729-140-63	TRANSISTOR 2SA1611-M5M6	
Q570	8-729-905-15	TRANSISTOR DTC144WU	
Q571	8-729-920-39	TRANSISTOR IMT-1US	
Q572	8-729-805-25	TRANSISTOR 2SB1121	
Q573	8-729-905-18	TRANSISTOR DTC144EU	
Q610	8-729-403-10	TRANSISTOR XN6215	
Q612	8-729-921-08	TRANSISTOR DTC144TU	
Q613	8-729-117-32	TRANSISTOR 2SC4177	
Q614	8-729-117-32	TRANSISTOR 2SC4177	
Q619	8-729-117-32	TRANSISTOR 2SC4177	
Q620	8-729-117-32	TRANSISTOR 2SC4177	
Q621	8-729-402-19	TRANSISTOR XN6501	
		(RESISTOR)	
R001	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R002	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R003	1-216-864-11	METAL CHIP 0 5% 1/16W	
R005	1-216-864-11	METAL CHIP 0 5% 1/16W	

Ref. No.	Part No.	Description				Remark
R008	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R011	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R012	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R013	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R014	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R015	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R016	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R018	1-216-813-11	METAL CHIP	220	5%	1/16W	
R020	1-216-813-11	METAL CHIP	220	5%	1/16W	
R051	1-216-864-11	METAL CHIP	0	5%	1/16W	
R052	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R056	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R058	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R059	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R063	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R064	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R065	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R066	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R067	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R068	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R069	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R070	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R075	1-216-864-11	METAL CHIP	0	5%	1/16W	
R102	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R103	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R104	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R105	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R107	1-216-820-11	METAL CHIP	820	5%	1/16W	
R108	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R109	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R111	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R112	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R116	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R117	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R118	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R123	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R133	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R134	1-216-850-11	METAL CHIP	270K	5%	1/16W	
R135	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R136	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R137	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R138	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R141	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R142	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R143	1-216-864-11	METAL CHIP	0	5%	1/16W	
R144	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R147	1-216-864-11	METAL CHIP	0	5%	1/16W	
R148	1-216-809-11	METAL CHIP	100	5%	1/16W	
R149	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R150	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R151	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R152	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R153	1-216-864-11	METAL CHIP	0	5%	1/16W	
R154	1-216-809-11	METAL CHIP	100	5%	1/16W	
R155	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R156	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R162	1-216-812-11	METAL CHIP	180	5%	1/16W	
R163	1-216-811-11	METAL CHIP	150	5%	1/16W	
R165	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R166	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R168	1-216-864-11	METAL CHIP	0	5%	1/16W	
R170	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R171	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R172	1-216-864-11	METAL CHIP	0	5%	1/16W	
R177	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R178	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R181	1-216-072-00	METAL CHIP	9.1K	5%	1/10W	
R182	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R183	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R184	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R185	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R186	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R187	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R188	1-216-812-11	METAL CHIP	180	5%	1/16W	
R189	1-216-820-11	METAL CHIP	820	5%	1/16W	
R190	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R193	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R194	1-216-820-11	METAL CHIP	820	5%	1/16W	
R195	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R196	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R197	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R199	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R200	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R201	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R202	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R203	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R204	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R205	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R206	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R207	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R208	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R209	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R210	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R211	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R212	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R213	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R214	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R215	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R217	1-216-864-11	METAL CHIP	0	5%	1/16W	
R218	1-216-839-11	METAL CHIP	33K	5%	1/16W	

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Ref. No.	Part No.	Description				Remark
R219	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R220	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R221	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R222	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R223	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R224	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R225	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R226	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R229	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R231	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R233	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R234	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R235	1-216-671-11	METAL CHIP	6.8K	0.5%	1/10W	
R236	1-216-673-11	METAL CHIP	8.2K	0.5%	1/10W	
R237	1-216-683-11	METAL CHIP	22K	0.5%	1/10W	
R238	1-216-671-11	METAL CHIP	6.8K	0.5%	1/10W	
R239	1-216-659-11	METAL CHIP	2.2K	0.5%	1/10W	
R240	1-216-681-11	METAL CHIP	18K	0.5%	1/10W	
R241	1-216-842-11	METAL CHIP	56K	5%	1/16W	
R242	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R243	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R244	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R245	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R246	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R267	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R268	1-216-818-11	METAL CHIP	560	5%	1/16W	
R269	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R270	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R272	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R273	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R274	1-216-818-11	METAL CHIP	560	5%	1/16W	
R275	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R276	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R277	1-216-834-11	METAL CHIP	12K	5%	1/16W	
R278	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R295	1-216-864-11	METAL CHIP	0	5%	1/16W	
R296	1-216-864-11	METAL CHIP	0	5%	1/16W	
R301	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R302	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R303	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R304	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R305	1-216-864-11	METAL CHIP	0	5%	1/16W	
R307	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R310	1-216-864-11	METAL CHIP	0	5%	1/16W	
R311	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R312	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R313	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R314	1-216-816-11	METAL CHIP	390	5%	1/16W	
R316	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R318	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R319	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R320	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R321	1-216-864-11	METAL CHIP	0	5%	1/16W	
R322	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R323	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R331	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R332	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R337	1-216-675-11	METAL CHIP	10K	0.5%	1/10W	
R338	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R339	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R341	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R342	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R347	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R349	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R350	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R351	1-216-864-11	METAL CHIP	0	5%	1/16W	
R352	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R353	1-216-864-11	METAL CHIP	0	5%	1/16W	
R355	1-216-864-11	METAL CHIP	0	5%	1/16W	
R356	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R357	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R358	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R359	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R361	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R362	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R364	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R365	1-216-864-11	METAL CHIP	0	5%	1/16W	
R366	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R367	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R368	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R369	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R370	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R371	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R372	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R373	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R374	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R375	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R376	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R377	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R378	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R382	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R383	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R384	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R385	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R386	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R388	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R391	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R392	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R394	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R395	1-216-837-11	METAL CHIP	22K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R398	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R401	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R402	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R403	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R404	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R405	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R406	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R407	1-216-864-11	METAL CHIP	0	5%	1/16W	
R408	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R409	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R410	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R413	1-216-813-11	METAL CHIP	220	5%	1/16W	
R414	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R415	1-216-813-11	METAL CHIP	220	5%	1/16W	
R417	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R418	1-216-864-11	METAL CHIP	0	5%	1/16W	
R422	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R424	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R425	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R426	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R427	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R428	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R429	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R430	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R441	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R442	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R443	1-216-864-11	METAL CHIP	0	5%	1/16W	
R560	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R561	1-216-849-11	METAL CHIP	220K	5%	1/16W	
R562	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R563	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R564	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R565	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R566	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R567	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R568	1-216-097-00	METAL CHIP	100K	5%	1/10W	
R569	1-216-852-11	METAL CHIP	390K	5%	1/16W	
R570	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R571	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R572	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R573	1-216-851-11	METAL CHIP	330K	5%	1/16W	
R574	1-216-809-11	METAL CHIP	100	5%	1/16W	
R575	1-216-861-11	METAL CHIP	2.2M	5%	1/16W	
R576	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R577	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R578	1-216-136-00	METAL GLAZE	2.7	5%	1/8W	
R579	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R580	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R581	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R582	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R583	1-218-172-11	METAL CHIP	680K	1%	1/10W	
R584	1-218-172-11	METAL CHIP	680K	1%	1/10W	
R585	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R587	1-216-807-11	METAL CHIP	68	5%	1/16W	
R589	1-216-864-11	METAL CHIP	0	5%	1/16W	
R609	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R610	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R611	1-216-864-11	METAL CHIP	0	5%	1/16W	
R617	1-216-864-11	METAL CHIP	0	5%	1/16W	
R618	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R619	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R620	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R621	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R623	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R624	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R631	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R632	1-216-819-11	METAL CHIP	680	5%	1/16W	
R633	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R634	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R635	1-216-854-11	METAL CHIP	560K	5%	1/16W	
R636	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R638	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R639	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R640	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R641	1-216-818-11	METAL CHIP	560	5%	1/16W	
R642	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R643	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R644	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R645	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R647	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R649	1-216-685-11	METAL CHIP	27K	0.5%	1/10W	
R650	1-216-675-11	METAL CHIP	10K	0.5%	1/10W	
R651	1-216-675-11	METAL CHIP	10K	0.5%	1/10W	
R653	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R654	1-216-864-11	METAL CHIP	0	5%	1/16W	
R656	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R657	1-216-818-11	METAL CHIP	560	5%	1/16W	
R659	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R661	1-216-813-11	METAL CHIP	220	5%	1/16W	
R662	1-216-813-11	METAL CHIP	220	5%	1/16W	
R663	1-216-813-11	METAL CHIP	220	5%	1/16W	
R664	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R665	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R700	1-216-296-00	METAL CHIP	0	5%	1/8W	

〈 CONPOSITION CIRCUIT BLOCK 〉

Ref. No.	Part No.	Description
RB101	1-236-424-11	NETWORK, RES 10K
RB141	1-236-416-11	NETWORK, RES 2.2K
RB181	1-236-414-11	NETWORK, RES 1.5K
RB182	1-236-412-11	NETWORK, RES 1.0K

Ref. No.	Part No.	Description	Remark
RB183	1-236-420-11	NETWORK, RES 4.7K	
RB184	1-236-420-11	NETWORK, RES 4.7K	
RB252	1-236-409-11	NETWORK, RES 560	
RB253	1-236-409-11	NETWORK, RES 560	
RB301	1-236-412-11	NETWORK, RES 1.0K	
RB362	1-236-436-11	NETWORK, RES 100K	
RB363	1-236-424-11	NETWORK, RES 10K	
RB561	1-236-436-11	NETWORK, RES 100K	
RB562	1-236-436-11	NETWORK, RES 100K	
RB563	1-236-412-11	NETWORK, RES 1.0K	
RB564	1-236-436-11	NETWORK, RES 100K	
RB565	1-236-436-11	NETWORK, RES 100K	
RB566	1-236-436-11	NETWORK, RES 100K	
RB567	1-236-412-11	NETWORK, RES 1.0K	
RB569	1-236-412-11	NETWORK, RES 1.0K	
RB570	1-236-432-11	NETWORK, RES 47K	
RB571	1-236-412-11	NETWORK, RES 1.0K	
RB572	1-236-412-11	NETWORK, RES 1.0K	
RB574	1-236-436-11	NETWORK, RES 100K	
RB575	1-236-436-11	NETWORK, RES 100K	
RB576	1-236-424-11	NETWORK, RES 10K	
RB577	1-236-424-11	NETWORK, RES 10K	
RB611	1-236-424-11	NETWORK, RES 10K	
RB613	1-236-436-11	NETWORK, RES 100K	
RB614	1-236-424-11	NETWORK, RES 10K	

(VARIABLE RESISTOR)

RV561	1-238-093-11	RES, ADJ, CERMET 100K	
RV561	1-238-859-11	RES, ADJ, CERMET 100K	

(FLAT CABLE)

W303	1-590-112-11	CABLE, FLAT (FFC-4)	
W964	1-590-113-11	CABLE, FLAT (FFC-5)	

(VIBRATOR)

X101	1-579-076-11	VIBRATOR, CRYSTAL (28.375MHz)	
X141	1-567-733-11	VIBRATOR, CRYSTAL (17MHz)	
X361	1-577-118-11	VIBRATOR, LITHIUM NIOBATE	
X561	1-579-049-21	VIBRATOR, CRYSTAL (32.768kHz)	

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* A-7062-629-A VF-41 (P) BOARD, COMPLETE

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(Ref. No 3,000 Series)

3-747-126-01 HOLDER, LED

(CAPACITOR)

C951	1-126-176-11	ELECT	220uF	20%	10V
C952	1-163-077-00	CERAMIC CHIP	0.1uF	10%	25V
C954	1-135-091-00	TANTALUM CHIP	1uF	20%	16V
C955	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C956	1-131-381-00	TANTALUM	47uF	10%	10V
C957	1-162-638-11	CERAMIC CHIP	1uF		16V
C958	1-136-718-11	FILM, CHIP	0.1uF	5%	25V
C959	1-163-115-00	CERAMIC CHIP	82PF	5%	50V
C960	1-127-515-11	ELECT(SOLID)	47uF	20%	6.3V
⚠C961	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
⚠C962	1-162-625-11	CERAMIC CHIP	0.0047uF	5%	50V
⚠C963	1-163-009-11	CERAMIC CHIP	0.001uF	10%	50V
C964	1-126-090-11	ELECT	82uF	20%	10V
C965	1-124-257-00	ELECT	2.2uF	20%	50V
C966	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C967	1-164-611-11	CERAMIC CHIP	0.001uF	10%	500V
⚠C968	1-162-625-11	CERAMIC CHIP	0.0047uF	5%	50V

(CONNECTOR)

* CN951	1-566-759-11	PIN, CONNECTOR (PC BOARD) 4P
* CN952	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P
* CN953	1-566-195-11	PIN, CONNECTOR (PC BOARD) 2P

(DIODE)

D951	8-719-820-65	DIODE	TLS221
D952	8-719-984-02	LED	BR4371F
D953	8-719-400-20	DIODE	MA152WA
D954	8-719-420-15	DIODE	MA8082-M(TX)

(IC)

IC951	8-759-420-01	IC	AN2512S

(COIL)

L951	1-412-031-11	INDUCTOR CHIP	47uH
L952	1-408-781-00	INDUCTOR CHIP	22uH
⚠L953	1-459-876-41	COIL, FERRITE (HLC)	

(TRANSISTOR)

Q951	8-729-216-31	TRANSISTOR	2SA1163-G
Q952	8-729-106-68	TRANSISTOR	2SD1615A-GP

(RESISTOR)

R951	1-216-041-00	METAL CHIP	470	5%	1/10W
R953	1-216-041-00	METAL CHIP	470	5%	1/10W
R955	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R956	1-216-063-00	METAL CHIP	3.9K	5%	1/10W
R957	1-216-061-00	METAL CHIP	3.3K	5%	1/10W
R958	1-216-097-00	METAL CHIP	100K	5%	1/10W
R959	1-216-113-00	METAL CHIP	470K	5%	1/10W
R960	1-216-053-00	METAL CHIP	1.5K	5%	1/10W
R962	1-216-336-11	METAL CHIP	47K	1%	1/10W
R963	1-216-107-00	METAL CHIP	270K	5%	1/10W

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description				Remark
R964	1-216-025-00	METAL CHIP	100	5%	1/10W	
R965	1-216-308-00	METAL CHIP	4.7	5%	1/10W	
R966	1-216-055-00	METAL CHIP	1.8K	5%	1/10W	
R967	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R968	1-216-033-00	METAL CHIP	220	5%	1/10W	
R969	1-216-079-00	METAL CHIP	18K	5%	1/10W	
R971	1-216-870-11	METAL CHIP	180K	1%	1/10W	
R973	1-216-005-00	METAL CHIP	15	5%	1/10W	
R974	1-216-133-00	METAL CHIP	3.3M	5%	1/10W	
R975	1-216-133-00	METAL CHIP	3.3M	5%	1/10W	
R976	1-216-125-00	METAL CHIP	1.5M	5%	1/10W	
R977	1-216-121-00	METAL CHIP	1M	5%	1/10W	
R978	1-216-011-00	METAL CHIP	27	5%	1/10W	
		(VARIABLE RESISTOR)				
RV951	1-238-092-11	RES, ADJ, CERMET 47K				
RV952	1-238-086-11	RES, ADJ, CERMET 470				
RV952	1-238-852-11	RES, ADJ, CERMET 470				
RV953	1-238-088-11	RES, ADJ, CERMET 2.2K				
RV953	1-238-854-11	RES, ADJ, CERMET 2.2K				
RV954	1-241-497-11	RES, ADJ, METAL GLAZE				
RV955	1-238-096-11	RES, ADJ CERMET 1M				
		(TRANSFORMER)				
⚠T951	1-439-494-11	TRANSFORMER ASSY, FLYBACK				
		(THERMISTOR)				
TH951	1-809-350-21	THERMISTOR				
		(FLAT CABLE)				
⚠W951	1-526-978-41	SOCKET ASSY, CRT				

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A-7062-990-A VS-91 BOARD, COMPLETE
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(Ref. No 2,000 Series)

Ref. No.	Part No.	Description				Remark
	1-636-499-11	FP363 FLEXIBLE BOARD				
	1-636-501-11	FP355 FLEXIBLE BOARD				
*	3-736-316-01	CASE (UPPER), RP SHIELD				
*	3-736-317-01	CASE (LOWER), RP SHIELD				
*	3-736-322-01	CASE, FE SHIELD				
*	3-736-887-01	PLATE, SHIELD, PAL DELAY LINE				
		(CAPACITOR)				
C101	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V	
C102	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V	
C104	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V	
C107	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C108	1-135-161-21	TANTALUM CHIP	22uF	10%	10V	

Ref. No.	Part No.	Description				Remark
C111	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C112	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C123	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C125	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C126	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C127	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C128	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C131	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C132	1-135-161-21	TANTALUM CHIP	22uF	10%	10V	
C135	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C136	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C147	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C149	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C150	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C151	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C152	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C162	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V	
C163	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C164	1-135-161-21	TANTALUM CHIP	22uF	10%	10V	
C165	1-162-948-11	CERAMIC CHIP	39PF	5%	50V	
C166	1-162-963-11	CERAMIC CHIP	680PF	10%	50V	
C167	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C168	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C169	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C170	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V	
C171	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C172	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C173	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C174	1-135-177-21	TANTALUM CHIP	1uF	20%	20V	
C175	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C176	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C177	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C178	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C179	1-135-177-21	TANTALUM CHIP	1uF	20%	20V	
C180	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C181	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V	
C182	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C183	1-135-161-21	TANTALUM CHIP	22uF	10%	10V	
C184	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C185	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C186	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V	
C187	1-162-918-11	CERAMIC CHIP	18PF	5%	50V	
C188	1-162-918-11	CERAMIC CHIP	18PF	5%	50V	
C192	1-163-038-00	CERAMIC CHIP	0.1uF		25V	
C193	1-162-953-11	CERAMIC CHIP	100PF	5%	50V	
C194	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	
C195	1-162-927-11	CERAMIC CHIP	100PF	5%	50V	
C196	1-164-217-11	CERAMIC CHIP	150PF	5%	50V	
C197	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V	
C201	1-135-145-11	TANTALUM CHIP	0.47uF	10%	35V	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description			Remark
C204	1-124-779-00	ELECT CHIP	10uF	20%	16v
C205	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C206	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C207	1-126-246-11	ELECT CHIP	220uF	20%	4V
C208	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C209	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C210	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C211	1-135-149-21	TANTALUM CHIP	2. 2uF	20%	10V
C212	1-135-146-21	TANTALUM CHIP	0. 68uF	20%	25V
C213	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C214	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C215	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C216	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C217	1-135-145-11	TANTALUM CHIP	0. 47uF	10%	35V
C218	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C221	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C222	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C223	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C224	1-162-638-11	CERAMIC CHIP	1uF		16V
C227	1-162-638-11	CERAMIC CHIP	1uF		16V
C229	1-162-638-11	CERAMIC CHIP	1uF		16V
C230	1-162-638-11	CERAMIC CHIP	1uF		16V
C232	1-162-638-11	CERAMIC CHIP	1uF		16V
C233	1-135-180-21	TANTALUM CHIP	3. 3uF	20%	6. 3V
C234	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C235	1-162-638-11	CERAMIC CHIP	1uF		16V
C236	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C237	1-162-638-11	CERAMIC CHIP	1uF		16V
C238	1-162-638-11	CERAMIC CHIP	1uF		16V
C239	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C240	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C241	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C242	1-135-180-21	TANTALUM CHIP	3. 3uF	20%	6. 3V
C243	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C244	1-162-638-11	CERAMIC CHIP	1uF		16V
C245	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C246	1-135-180-21	TANTALUM CHIP	3. 3uF	20%	6. 3V
C247	1-164-156-11	CERAMIC CHIP	0. 1uF		25V
C248	1-135-070-00	TANTALUM CHIP	0. 1uF	10%	35V
C249	1-162-638-11	CERAMIC CHIP	1uF		16V
C250	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C251	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C252	1-162-937-11	CERAMIC CHIP	6PF	0. 5PF	50V
C253	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C254	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C256	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C257	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C258	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C259	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C260	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C261	1-162-944-11	CERAMIC CHIP	18PF	5%	50V
C262	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C263	1-164-633-11	CERAMIC CHIP	0. 1uF	10%	25V
C264	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C265	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C266	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C267	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C268	1-163-131-00	CERAMIC CHIP	390PF	5%	50V
C269	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C270	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C271	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C272	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C273	1-162-950-11	CERAMIC CHIP	56PF	5%	50V
C274	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C275	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C276	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C277	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C278	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C279	1-162-964-11	CERAMIC CHIP	0. 001uF	10%	50V
C280	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C281	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C282	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C283	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C284	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C285	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C287	1-162-951-11	CERAMIC CHIP	68PF	5%	50V
C288	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C289	1-135-161-21	TANTALUM CHIP	22uF	10%	10V
C290	1-162-957-11	CERAMIC CHIP	220PF	5%	50V
C291	1-162-638-11	CERAMIC CHIP	1uF		16V
C293	1-135-161-21	TANTALUM CHIP	22uF	10%	10V
C294	1-135-145-11	TANTALUM CHIP	0. 47uF	10%	35V
C295	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C296	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C297	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C298	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C299	1-162-970-11	CERAMIC CHIP	0. 01uF	10%	25V
C301	1-162-946-11	CERAMIC CHIP	27PF	5%	50V
C302	1-126-205-11	ELECT CHIP	47uF	20%	6. 3V
C303	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C304	1-135-157-21	TANTALUM CHIP	10uF	20%	6. 3V
C305	1-162-974-11	CERAMIC CHIP	0. 01uF		50V
C306	1-163-986-00	CERAMIC CHIP	0. 027uF	10%	25V
C307	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C308	1-162-966-11	CERAMIC CHIP	0. 0022uF	10%	50V
C309	1-162-947-11	CERAMIC CHIP	33PF	5%	50V
C310	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C312	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C313	1-162-962-11	CERAMIC CHIP	470PF	10%	50V
C314	1-135-161-21	TANTALUM CHIP	22uF	10%	10V

Ref. No.	Part No.	Description			Remark
C315	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C316	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C317	1-162-943-11	CERAMIC CHIP	15PF	5%	50V
C318	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C319	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C320	1-162-956-11	CERAMIC CHIP	180PF	5%	50V
C321	1-162-999-11	CERAMIC CHIP	91PF	5%	50V
C322	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C323	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C324	1-162-952-11	CERAMIC CHIP	82PF	5%	50V
C325	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C326	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C327	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C329	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C330	1-162-939-11	CERAMIC CHIP	8PF	0.5PF	50V
C331	1-162-958-11	CERAMIC CHIP	270PF	5%	50V
C333	1-162-936-11	CERAMIC CHIP	5PF	0.25PF	50V
C334	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C335	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C336	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C337	1-162-942-11	CERAMIC CHIP	12PF	5%	50V
C338	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C340	1-162-948-11	CERAMIC CHIP	39PF	5%	50V
C344	1-162-941-11	CERAMIC CHIP	10PF	0.5PF	50V
C345	1-162-953-11	CERAMIC CHIP	100PF	5%	50V
C346	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C347	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C348	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C349	1-163-118-00	CERAMIC CHIP	110PF	5%	50V
C350	1-162-959-11	CERAMIC CHIP	330PF	5%	50V
C351	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C352	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C353	1-135-181-21	TANTALUM CHIP	4.7uF	20%	6.3V
C354	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C355	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C356	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C358	1-162-638-11	CERAMIC CHIP	1uF		16V
C359	1-164-156-11	CERAMIC CHIP	0.1uF		25V
C366	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C371	1-162-954-11	CERAMIC CHIP	120PF	5%	50V
C501	1-130-495-00	MYLAR	0.1uF	5%	50V
C502	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C503	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C504	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C505	1-163-037-11	CERAMIC CHIP	0.022uF	10%	25V
C506	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C507	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C508	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C509	1-162-967-11	CERAMIC CHIP	0.0033uF	10%	50V
C511	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C512	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C513	1-124-779-00	ELECT CHIP	10uF	20%	16v
C514	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V
C515	1-135-149-21	TANTALUM CHIP	2.2uF	20%	10V
C518	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C519	1-162-969-11	CERAMIC CHIP	0.0068uF	10%	25V
C520	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C521	1-162-638-11	CERAMIC CHIP	1uF		16V
C522	1-124-779-00	ELECT CHIP	10uF	20%	16v
C523	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C524	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C525	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C530	1-164-299-11	CERAMIC CHIP	0.22uF	10%	25V
C531	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C532	1-164-299-11	CERAMIC CHIP	0.22uF	10%	25V
C542	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C543	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C544	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C546	1-164-633-11	CERAMIC CHIP	0.1uF	10%	25V
C547	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C548	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C549	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C550	1-162-638-11	CERAMIC CHIP	1uF		16V
C551	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C552	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C553	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C554	1-164-227-11	CERAMIC CHIP	0.022uF	10%	25V
C555	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C556	1-162-638-11	CERAMIC CHIP	1uF		16V
C557	1-162-638-11	CERAMIC CHIP	1uF		16V
C558	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C559	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C560	1-162-921-11	CERAMIC CHIP	33PF	5%	50V
C561	1-162-638-11	CERAMIC CHIP	1uF		16V
C562	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C563	1-163-141-00	CERAMIC CHIP	0.001uF	5%	50V
C564	1-162-949-11	CERAMIC CHIP	47PF	5%	50V
C565	1-163-145-00	CERAMIC CHIP	0.0015uF	5%	50V
C566	1-162-945-11	CERAMIC CHIP	22PF	5%	50V
C567	1-163-809-11	CERAMIC CHIP	0.047uF	10%	25V
C571	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C572	1-164-232-11	CERAMIC CHIP	0.01uF		50V
C573	1-164-634-11	CERAMIC CHIP	1uF		16V
C601	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C602	1-162-916-11	CERAMIC CHIP	12PF	5%	50V
C603	1-162-968-11	CERAMIC CHIP	0.0047uF	10%	50V
C604	1-135-177-21	TANTALUM CHIP	1uF	20%	20V
C606	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C607	1-124-443-00	ELECT	100uF	20%	10V
C608	1-135-180-21	TANTALUM CHIP	3.3uF	20%	6.3V

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Ref. No.	Part No.	Description			Remark
C609	1-162-638-11	CERAMIC CHIP	1uF		16V
C610	1-162-638-11	CERAMIC CHIP	1uF		16V
C611	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C612	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C613	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C615	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C616	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C618	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C620	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C622	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C623	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
C624	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C661	1-162-966-11	CERAMIC CHIP	0.0022uF	10%	50V
C662	1-163-023-00	CERAMIC CHIP	0.015uF	5%	50V
C663	1-163-038-00	CERAMIC CHIP	0.1uF		25V
C664	1-163-133-00	CERAMIC CHIP	470PF	5%	50V
C665	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C666	1-162-974-11	CERAMIC CHIP	0.01uF		50V
C667	1-163-081-00	CERAMIC CHIP	0.22uF		25V
C668	1-163-035-00	CERAMIC CHIP	0.047uF		50V
C681	1-135-157-21	TANTALUM CHIP	10uF	20%	6.3V
		(CONNECTOR)			
CN2	1-568-329-11	CONNECTOR, BOARD TO BOARD 17P			
CN101	1-566-531-11	CONNECTOR, FPC (ZIF) 15P			
CN201	1-566-542-31	CONNECTOR, FPC (NON ZIF) 10P			
CN202	1-568-342-41	CONNECTOR, BOARD TO BOARD 7P			
CN203	1-580-496-11	CONNECTOR, BOARD TO BOARD(R)14P			
CN204	1-568-364-41	CONNECTOR, BOARD TO BOARD 12P			
* CN205	1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P			
* CN206	1-565-876-11	PIN, CONNECTOR (PC BOARD) 4P			
CN501	1-566-541-11	CONNECTOR, FPC (NON ZIF) 9P			
CN502	1-562-880-11	CONNECTOR, CARD EDGE 15P			
CN601	1-566-538-11	CONNECTOR, FPC (NON ZIF) 6P			
CN602	1-566-546-11	CONNECTOR, FPC (NON ZIF) 14P			
CN603	1-568-367-41	CONNECTOR, BOARD TO BOARD 18P			
CN604	1-568-334-11	CONNECTOR, BOARD TO BOARD 16P			
CN607	1-565-527-11	PIN, CONNECTOR (PC BOARD) 2P			
		(DIODE)			
D201	8-719-988-62	DIODE	1SS355		
D211	8-719-118-21	DIODE	1SS283		
D213	8-719-404-35	DIODE	MA141WK		
D214	8-719-404-35	DIODE	MA141WK		
D215	8-719-800-76	DIODE	1SS226		
D216	8-719-988-62	DIODE	1SS355		
D217	8-719-988-62	DIODE	1SS355		
D218	8-719-988-62	DIODE	1SS355		
D501	8-719-404-46	DIODE	MA110-TX		
D601	8-719-404-40	DIODE	MA121		
D602	8-719-404-40	DIODE	MA121		
D603	8-719-404-40	DIODE	MA121		
D604	8-719-404-40	DIODE	MA121		
D605	8-719-988-62	DIODE	1SS355		
D606	8-719-988-62	DIODE	1SS355		
		(FILTER)			
FL201	1-236-186-11	FILTER, BAND PASS			
FL202	1-409-446-11	FILTER, TRAP			
FL203	1-577-162-11	FILTER, CERAMIC			
		(IC)			
IC101	8-752-033-38	IC	CXA1202R		
IC102	8-752-033-38	IC	CXA1202R		
IC201	8-752-033-40	IC	CXA1201Q		
IC202	8-752-324-87	IC	CXL1502M		
IC203	8-752-034-40	IC	CXA1200BQ		
IC204	8-759-605-61	IC	CXA1203N		
IC205	8-759-009-22	IC	MC14094BF		
IC501	8-759-990-55	IC	CXA8006M		
IC502	8-759-148-05	IC	CXA8010M		
IC504	8-752-038-71	IC	CXA1127AM		
IC505	8-752-035-48	IC	CXA1204Q		
IC601	8-752-833-68	IC	CXP80116-851Q		
IC602	8-759-502-36	IC	S-81350HG		
IC603	8-759-987-66	IC	TL7757		
IC604	8-759-100-95	IC	uPC324G2		
IC607	8-759-100-93	IC	uPC393G2		
		(COIL)			
L101	1-412-033-11	INDUCTOR CHIP	220uH		
L102	1-410-385-11	INDUCTOR CHIP	22uH		
L103	1-412-033-11	INDUCTOR CHIP	220uH		
L104	1-410-385-11	INDUCTOR CHIP	22uH		
L161	1-412-029-11	INDUCTOR CHIP	10uH		
L162	1-412-029-11	INDUCTOR CHIP	10uH		
L191	1-412-033-11	INDUCTOR CHIP	220uH		
L192	1-410-381-11	INDUCTOR CHIP	10uH		
L201	1-410-393-11	INDUCTOR CHIP	100uH		
L202	1-410-393-11	INDUCTOR CHIP	100uH		
L203	1-412-031-11	INDUCTOR CHIP	47uH		
L204	1-412-031-11	INDUCTOR CHIP	47uH		
L205	1-410-388-21	INDUCTOR CHIP	39uH		
L207	1-410-393-11	INDUCTOR CHIP	100uH		
L208	1-410-387-11	INDUCTOR CHIP	33uH		
L209	1-410-390-11	INDUCTOR CHIP	56uH		
L210	1-412-029-11	INDUCTOR CHIP	10uH		
L211	1-410-389-31	INDUCTOR CHIP	47uH		
L212	1-410-393-11	INDUCTOR CHIP	100uH		
L213	1-410-377-31	INDUCTOR CHIP	4.7uH		

Ref. No.	Part No.	Description	Remark
L214	1-408-797-11	INDUCTOR CHIP 470uH	
L215	1-408-795-21	INDUCTOR CHIP 330uH	
L216	1-410-388-21	INDUCTOR CHIP 39uH	
L217	1-408-795-21	INDUCTOR CHIP 330uH	
L218	1-410-393-11	INDUCTOR CHIP 100uH	
L219	1-410-380-31	INDUCTOR CHIP 8.2uH	
L220	1-408-795-21	INDUCTOR CHIP 330uH	
L221	1-410-655-31	INDUCTOR CHIP 120uH	
L222	1-412-138-11	INDUCTOR 100uH	
L223	1-410-656-11	INDUCTOR CHIP 150uH	
L224	1-410-657-21	INDUCTOR CHIP 180uH	
L225	1-410-387-11	INDUCTOR CHIP 33uH	
L226	1-410-657-21	INDUCTOR CHIP 180uH	
L227	1-410-381-11	INDUCTOR CHIP 10uH	
L228	1-412-029-11	INDUCTOR CHIP 10uH	
L229	1-410-393-11	INDUCTOR CHIP 100uH	
L230	1-410-393-11	INDUCTOR CHIP 100uH	
L231	1-410-658-31	INDUCTOR CHIP 220uH	
L502	1-408-795-21	INDUCTOR CHIP 330uH	
L503	1-412-032-11	INDUCTOR CHIP 100uH	
L504	1-412-032-11	INDUCTOR CHIP 100uH	
L601	1-412-031-11	INDUCTOR CHIP 47uH	
L602	1-412-031-11	INDUCTOR CHIP 47uH	
		(IC LINK)	
⚠PS601	1-532-605-00	LINK, IC 0.4A	
⚠PS602	1-532-685-00	LINK, IC	
		(TRANSISTOR)	
Q161	8-729-403-35	TRANSISTOR UN5113	
Q162	8-729-117-32	TRANSISTOR 2SC4177	
Q164	8-729-905-18	TRANSISTOR DTC144EU	
Q165	8-729-905-18	TRANSISTOR DTC144EU	
Q166	8-729-905-18	TRANSISTOR DTC144EU	
Q191	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q193	8-729-216-22	TRANSISTOR 2SA1162	
Q201	8-729-101-07	TRANSISTOR 2SB798-DL	
Q202	8-729-905-24	TRANSISTOR 2SA1576-S	
Q203	8-729-905-24	TRANSISTOR 2SA1576-S	
Q204	8-729-905-18	TRANSISTOR DTC144EU	
Q205	8-729-905-24	TRANSISTOR 2SA1576-S	
Q208	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q209	8-729-905-18	TRANSISTOR DTC144EU	
Q212	8-729-905-24	TRANSISTOR 2SA1576-S	
Q213	8-729-120-28	TRANSISTOR 2SC1623-L5L6	
Q214	8-729-117-32	TRANSISTOR 2SC4177	
Q217	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q218	8-729-117-32	TRANSISTOR 2SC4177	
Q219	8-729-905-24	TRANSISTOR 2SA1576-S	
Q220	8-729-117-32	TRANSISTOR 2SC4177	
Q221	8-729-403-35	TRANSISTOR UN5113	
Q222	8-729-117-32	TRANSISTOR 2SC4177	
Q223	8-729-905-24	TRANSISTOR 2SA1576-S	
Q224	8-729-403-35	TRANSISTOR UN5113	
Q225	8-729-117-32	TRANSISTOR 2SC4177	
Q227	8-729-905-24	TRANSISTOR 2SA1576-S	
Q228	8-729-117-32	TRANSISTOR 2SC4177	
Q229	8-729-905-15	TRANSISTOR DTC144WU	
Q230	8-729-117-32	TRANSISTOR 2SC4177	
Q231	8-729-905-15	TRANSISTOR DTC144WU	
Q232	8-729-140-88	TRANSISTOR FPIA3M	
Q233	8-729-117-32	TRANSISTOR 2SC4177	
Q234	8-729-117-32	TRANSISTOR 2SC4177	
Q235	8-729-905-24	TRANSISTOR 2SA1576-S	
Q236	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q237	8-729-117-16	TRANSISTOR 2SA1611-M6	
Q238	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q239	8-729-117-32	TRANSISTOR 2SC4177	
Q241	8-729-905-24	TRANSISTOR 2SA1576-S	
Q242	8-729-905-18	TRANSISTOR DTC144EU	
Q243	8-729-905-12	TRANSISTOR DTA144EU	
Q244	8-729-420-12	TRANSISTOR XN4213	
Q245	8-729-102-07	TRANSISTOR 2SC2223-F13	
Q246	8-729-117-32	TRANSISTOR 2SC4177	
Q247	8-729-117-32	TRANSISTOR 2SC4177	
Q248	8-729-403-35	TRANSISTOR UN5113	
Q249	8-729-420-12	TRANSISTOR XN4213	
Q250	8-729-403-35	TRANSISTOR UN5113	
Q251	8-729-905-18	TRANSISTOR DTC144EU	
Q252	8-729-117-32	TRANSISTOR 2SC4177	
Q253	8-729-117-32	TRANSISTOR 2SC4177	
Q254	8-729-403-35	TRANSISTOR UN5113	
Q256	8-729-905-18	TRANSISTOR DTC144EU	
Q258	8-729-921-08	TRANSISTOR DTC144TU	
Q259	8-729-921-58	TRANSISTOR DTA144TU	
Q260	8-729-117-32	TRANSISTOR 2SC4177	
Q261	8-729-905-24	TRANSISTOR 2SA1576-S	
Q270	8-729-905-24	TRANSISTOR 2SA1576-S	
Q272	8-729-905-24	TRANSISTOR 2SA1576-S	
Q501	8-729-920-39	TRANSISTOR IMT-1US	
Q541	8-729-905-24	TRANSISTOR 2SA1576-S	
Q542	8-729-117-32	TRANSISTOR 2SC4177	
Q543	8-729-905-24	TRANSISTOR 2SA1576-S	
Q571	8-729-920-39	TRANSISTOR IMT-1US	
Q572	8-729-920-39	TRANSISTOR IMT-1US	
Q573	8-729-117-32	TRANSISTOR 2SC4177	
Q601	8-729-403-24	TRANSISTOR XN4210	
Q602	8-729-403-24	TRANSISTOR XN4210	
Q603	8-729-403-24	TRANSISTOR XN4210	
Q604	8-729-403-24	TRANSISTOR XN4210	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Ref. No.	Part No.	Description	Remark
Q606	8-729-403-24	TRANSISTOR XN4210	
Q607	8-729-403-24	TRANSISTOR XN4210	
Q608	8-729-403-24	TRANSISTOR XN4210	
Q609	8-729-403-24	TRANSISTOR XN4210	
Q610	8-729-403-24	TRANSISTOR XN4210	
Q611	8-729-420-12	TRANSISTOR XN4213	
Q612	8-729-403-35	TRANSISTOR UN5113	
Q613	8-729-402-42	TRANSISTOR UN5213	
Q613	8-729-905-18	TRANSISTOR DTC144EU	
Q614	8-729-903-97	TRANSISTOR FMS1FE	
Q615	8-729-903-82	TRANSISTOR FMW2	
Q616	8-729-117-32	TRANSISTOR 2SC4177	
Q617	8-729-903-10	TRANSISTOR FMW1	
Q618	8-729-903-10	TRANSISTOR FMW1	
Q619	8-729-907-00	TRANSISTOR DTC114EU	
Q620	8-729-421-90	TRANSISTOR XN4113	
Q621	8-729-420-12	TRANSISTOR XN4213	
Q623	8-729-117-32	TRANSISTOR 2SC4177	
Q643	8-729-403-24	TRANSISTOR XN4210	
Q644	8-729-403-35	TRANSISTOR UN5113	
Q645	8-729-905-18	TRANSISTOR DTC144EU	
Q661	8-729-117-32	TRANSISTOR 2SC4177	
Q662	8-729-905-24	TRANSISTOR 2SA1576-S	
Q663	8-729-117-32	TRANSISTOR 2SC4177	
Q664	8-729-905-24	TRANSISTOR 2SA1576-S	
Q665	8-729-117-32	TRANSISTOR 2SC4177	
Q681	8-729-117-32	TRANSISTOR 2SC4177	
Q682	8-729-822-84	TRANSISTOR 2SB1202FAST	

〈 RESISTOR 〉

Ref. No.	Part No.	Description	Remark
R101	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R105	1-216-864-11	METAL CHIP 0 5% 1/16W	
R106	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R108	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R110	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R111	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R116	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R118	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R120	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R121	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R122	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R126	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R127	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R128	1-216-864-11	METAL CHIP 0 5% 1/16W	
R129	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R143	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R144	1-216-826-11	METAL CHIP 2.7K 5% 1/16W	
R162	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R163	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R164	1-216-841-11	METAL CHIP 47K 5% 1/16W	

Ref. No.	Part No.	Description	Remark
R165	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R166	1-216-832-11	METAL CHIP 8.2K 5% 1/16W	
R167	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R168	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R170	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R171	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R172	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R173	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R174	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R175	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R176	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R177	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R178	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R179	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R191	1-216-837-11	METAL CHIP 22K 5% 1/16W	
R192	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R193	1-216-815-11	METAL CHIP 330 5% 1/16W	
R194	1-216-817-11	METAL CHIP 470 5% 1/16W	
R197	1-216-801-11	METAL CHIP 22 5% 1/16W	
R198	1-216-818-11	METAL CHIP 560 5% 1/16W	
R201	1-216-804-11	METAL CHIP 39 5% 1/16W	
R202	1-216-804-11	METAL CHIP 39 5% 1/16W	
R203	1-216-657-11	METAL CHIP 1.8K 0.5% 1/10W	
R204	1-216-657-11	METAL CHIP 1.8K 0.5% 1/10W	
R205	1-216-791-11	METAL CHIP 3.3 5% 1/16W	
R206	1-216-829-11	METAL CHIP 4.7K 5% 1/16W	
R207	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R208	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R209	1-216-825-11	METAL CHIP 2.2K 5% 1/16W	
R210	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R211	1-216-022-00	METAL CHIP 75 5% 1/10W	
R214	1-216-828-11	METAL CHIP 3.9K 5% 1/16W	
R215	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R216	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R217	1-216-699-11	METAL CHIP 100K 0.5% 1/10W	
R218	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R219	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R220	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R221	1-216-840-11	METAL CHIP 39K 5% 1/16W	
R223	1-216-835-11	METAL CHIP 15K 5% 1/16W	
R224	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R226	1-216-815-11	METAL CHIP 330 5% 1/16W	
R227	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R228	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R229	1-216-810-11	METAL CHIP 120 5% 1/16W	
R230	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R231	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R232	1-216-822-11	METAL CHIP 1.2K 5% 1/16W	
R233	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R234	1-216-811-11	METAL CHIP 150 5% 1/16W	

Ref. No.	Part No.	Description				Remark
R237	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R243	1-216-820-11	METAL CHIP	820	5%	1/16W	
R244	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R245	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R246	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R247	1-216-807-11	METAL CHIP	68	5%	1/16W	
R249	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R250	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R251	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R252	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R253	1-216-819-11	METAL CHIP	680	5%	1/16W	
R254	1-216-828-11	METAL CHIP	3.9K	5%	1/16W	
R255	1-216-820-11	METAL CHIP	820	5%	1/16W	
R256	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R257	1-216-853-11	METAL CHIP	470K	5%	1/16W	
R258	1-216-864-11	METAL CHIP	0	5%	1/16W	
R259	1-216-820-11	METAL CHIP	820	5%	1/16W	
R260	1-216-864-11	METAL CHIP	0	5%	1/16W	
R261	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R262	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R263	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R264	1-216-813-11	METAL CHIP	220	5%	1/16W	
R265	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R266	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R267	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R268	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R269	1-216-651-11	METAL CHIP	1K	0.5%	1/10W	
R270	1-216-643-11	METAL CHIP	470	0.5%	1/10W	
R271	1-216-818-11	METAL CHIP	560	5%	1/16W	
R272	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R273	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R274	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R275	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R276	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R277	1-216-810-11	METAL CHIP	120	5%	1/16W	
R278	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R279	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R280	1-216-819-11	METAL CHIP	680	5%	1/16W	
R281	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R282	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R283	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R284	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R285	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R286	1-216-663-11	METAL CHIP	3.3K	0.5%	1/10W	
R287	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R288	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R289	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R290	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R291	1-216-855-11	METAL CHIP	680K	5%	1/16W	
R293	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R294	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R295	1-216-820-11	METAL CHIP	820	5%	1/16W	
R296	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R297	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R298	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R300	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R301	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R302	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R305	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R306	1-216-813-11	METAL CHIP	220	5%	1/16W	
R311	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R315	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R316	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R317	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R318	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R319	1-216-818-11	METAL CHIP	560	5%	1/16W	
R320	1-216-820-11	METAL CHIP	820	5%	1/16W	
R321	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R322	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R325	1-216-819-11	METAL CHIP	680	5%	1/16W	
R326	1-216-813-11	METAL CHIP	220	5%	1/16W	
R327	1-216-819-11	METAL CHIP	680	5%	1/16W	
R328	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R329	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R330	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R331	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R332	1-216-818-11	METAL CHIP	560	5%	1/16W	
R333	1-216-809-11	METAL CHIP	100	5%	1/16W	
R334	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R335	1-216-826-11	METAL CHIP	2.7K	5%	1/16W	
R336	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R337	1-216-818-11	METAL CHIP	560	5%	1/16W	
R338	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R339	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R341	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	
R342	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R343	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R344	1-216-818-11	METAL CHIP	560	5%	1/16W	
R345	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R346	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R347	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R348	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R349	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R352	1-216-820-11	METAL CHIP	820	5%	1/16W	
R354	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R355	1-216-817-11	METAL CHIP	470	5%	1/16W	
R356	1-216-808-11	METAL CHIP	82	5%	1/16W	
R357	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R358	1-216-824-11	METAL CHIP	1.8K	5%	1/16W	
R359	1-216-830-11	METAL CHIP	5.6K	5%	1/16W	

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

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Ref. No.	Part No.	Description				Remark
R360	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R361	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R362	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R363	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R364	1-216-805-11	METAL CHIP	47	5%	1/16W	
R365	1-216-823-11	METAL CHIP	1.5K	5%	1/16W	
R369	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R377	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R378	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R379	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R380	1-216-699-11	METAL CHIP	100K	0.5%	1/10W	
R381	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R382	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R390	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R391	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R393	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R394	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R396	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R501	1-216-336-11	METAL CHIP	47K	1%	1/10W	
R502	1-216-336-11	METAL CHIP	47K	1%	1/10W	
R503	1-216-101-00	METAL CHIP	150K	5%	1/10W	
R504	1-216-699-11	METAL CHIP	100K	0.5%	1/10W	
R505	1-216-661-11	METAL CHIP	2.7K	0.5%	1/10W	
R506	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R507	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R508	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R509	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R510	1-216-843-11	METAL CHIP	68K	5%	1/16W	
R511	1-216-815-11	METAL CHIP	330	5%	1/16W	
R512	1-217-671-11	METAL CHIP	1	5%	1/10W	
R513	1-217-671-11	METAL CHIP	1	5%	1/10W	
R514	1-217-671-11	METAL CHIP	1	5%	1/10W	
R515	1-217-671-11	METAL CHIP	1	5%	1/10W	
R521	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R522	1-216-841-11	METAL CHIP	47K	5%	1/16W	
R526	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R527	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R528	1-216-789-11	METAL CHIP	2.2	5%	1/16W	
R529	1-216-789-11	METAL CHIP	2.2	5%	1/16W	
R530	1-216-789-11	METAL CHIP	2.2	5%	1/16W	
R531	1-216-822-11	METAL CHIP	1.2K	5%	1/16W	
R532	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R533	1-216-836-11	METAL CHIP	18K	5%	1/16W	
R536	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R543	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R544	1-216-814-11	METAL CHIP	270	5%	1/16W	
R545	1-216-812-11	METAL CHIP	180	5%	1/16W	
R548	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R549	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R550	1-216-836-11	METAL CHIP	18K	5%	1/16W	

Ref. No.	Part No.	Description				Remark
R551	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R552	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R553	1-216-820-11	METAL CHIP	820	5%	1/16W	
R554	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R555	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R556	1-216-831-11	METAL CHIP	6.8K	5%	1/16W	
R557	1-216-832-11	METAL CHIP	8.2K	5%	1/16W	
R558	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R559	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R560	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R571	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R572	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R573	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R574	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R575	1-216-840-11	METAL CHIP	39K	5%	1/16W	
R576	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R577	1-216-819-11	METAL CHIP	680	5%	1/16W	
R580	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R590	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R591	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R592	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R593	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R594	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R595	1-216-829-11	METAL CHIP	4.7K	5%	1/16W	
R596	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R597	1-216-847-11	METAL CHIP	150K	5%	1/16W	
R599	1-216-825-11	METAL CHIP	2.2K	5%	1/16W	
R601	1-216-864-11	METAL CHIP	0	5%	1/16W	
		(E, Australian model)				
R602	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R604	1-216-827-11	METAL CHIP	3.3K	5%	1/16W	
R605	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R610	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R611	1-216-837-11	METAL CHIP	22K	5%	1/16W	
R612	1-216-852-11	METAL CHIP	390K	5%	1/16W	
R613	1-216-835-11	METAL CHIP	15K	5%	1/16W	
R614	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R615	1-216-838-11	METAL CHIP	27K	5%	1/16W	
R616	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R617	1-216-857-11	METAL CHIP	1M	5%	1/16W	
R618	1-216-839-11	METAL CHIP	33K	5%	1/16W	
R619	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R620	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R621	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R622	1-216-844-11	METAL CHIP	82K	5%	1/16W	
R625	1-216-821-11	METAL CHIP	1K	5%	1/16W	
R626	1-216-833-11	METAL CHIP	10K	5%	1/16W	
R627	1-216-817-11	METAL CHIP	470	5%	1/16W	
R634	1-216-174-00	METAL GLAZE	100	5%	1/8W	
R635	1-216-845-11	METAL CHIP	100K	5%	1/16W	
R645	1-216-845-11	METAL CHIP	100K	5%	1/16W	

Ref. No.	Part No.	Description	Remark
R646	1-216-845-11	METAL CHIP 100K 5% 1/16W	
R647	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R648	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R661	1-216-839-11	METAL CHIP 33K 5% 1/16W	
R662	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R663	1-216-821-11	METAL CHIP 1K 5% 1/16W	
R664	1-216-809-11	METAL CHIP 100 5% 1/16W	
R665	1-216-810-11	METAL CHIP 120 5% 1/16W	
R666	1-216-831-11	METAL CHIP 6.8K 5% 1/16W	
R667	1-216-843-11	METAL CHIP 68K 5% 1/16W	
R668	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R669	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R670	1-216-824-11	METAL CHIP 1.8K 5% 1/16W	
R671	1-216-838-11	METAL CHIP 27K 5% 1/16W	
R672	1-216-854-11	METAL CHIP 560K 5% 1/16W	
R673	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R674	1-216-851-11	METAL CHIP 330K 5% 1/16W	
R675	1-216-857-11	METAL CHIP 1M 5% 1/16W	
R676	1-216-861-11	METAL CHIP 2.2M 5% 1/16W	
R678	1-216-847-11	METAL CHIP 150K 5% 1/16W	
R679	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R681	1-216-833-11	METAL CHIP 10K 5% 1/16W	
R682	1-216-816-11	METAL CHIP 390 5% 1/16W	
R683	1-216-194-00	METAL CHIP 680 5% 1/8W	
R684	1-216-194-00	METAL CHIP 680 5% 1/8W	
R685	1-216-194-00	METAL CHIP 680 5% 1/8W	
R686	1-216-821-11	METAL CHIP 1K 5% 1/16W	

(CONPOSITION CIRCUIT BLOCK)

Ref. No.	Part No.	Description	Remark
RB201	1-236-424-11	NETWORK, RES 10K	
RB204	1-236-408-11	NETWORK, RES 470	
RB206	1-236-409-11	NETWORK, RES 560	
RB207	1-236-436-11	NETWORK, RES 100K	
RB208	1-236-412-11	NETWORK, RES 1.0K	
RB209	1-236-416-11	NETWORK, RES 2.2K	
RB502	1-236-424-11	NETWORK, RES 10K	
RB541	1-236-408-11	NETWORK, RES 470	
RB542	1-236-418-11	NETWORK, RES 3.3K	
RB543	1-236-418-11	NETWORK, RES 3.3K	
RB601	1-236-436-11	NETWORK, RES 100K	
RB602	1-236-436-11	NETWORK, RES 100K	
RB603	1-236-436-11	NETWORK, RES 100K	
RB604	1-236-436-11	NETWORK, RES 100K	
RB605	1-236-436-11	NETWORK, RES 100K	
RB606	1-236-436-11	NETWORK, RES 100K	
RB607	1-236-436-11	NETWORK, RES 100K	
RB608	1-236-436-11	NETWORK, RES 100K	
RB609	1-236-436-11	NETWORK, RES 100K	
RB610	1-236-424-11	NETWORK, RES 10K	
RB611	1-236-424-11	NETWORK, RES 10K	
RB612	1-236-424-11	NETWORK, RES 10K	
RB614	1-236-424-11	NETWORK, RES 10K	
RB615	1-236-436-11	NETWORK, RES 100K	
RB616	1-236-432-11	NETWORK, RES 47K	
RB617	1-236-444-11	NETWORK, RES 470K	
RB618	1-236-436-11	NETWORK, RES 100K	
RB619	1-236-424-11	NETWORK, RES 10K	
RB661	1-236-424-11	NETWORK, RES 10K	
RB662	1-236-442-11	NETWORK, RES 330K	
RB681	1-236-424-11	NETWORK, RES 10K	
RB682	1-236-424-11	NETWORK, RES 10K	

(VARIABLE RESISTOR)

Ref. No.	Part No.	Description	Remark
RV112	1-238-092-11	RES, ADJ, CERMET 47K	
RV113	1-238-092-11	RES, ADJ, CERMET 47K	
RV201	1-238-092-11	RES, ADJ, CERMET 47K	
RV202	1-238-087-11	RES, ADJ, CERMET 1K	
RV203	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV204	1-238-089-11	RES, ADJ, CERMET 4.7K	
RV205	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV206	1-238-092-11	RES, ADJ, CERMET 47K	
RV207	1-238-090-11	RES, ADJ, CERMET 10K	
RV208	1-238-086-11	RES, ADJ, CERMET 470	
RV209	1-238-087-11	RES, ADJ, CERMET 1K	
RV210	1-238-088-11	RES, ADJ, CERMET 2.2K	
RV212	1-238-089-11	RES, ADJ, CERMET 4.7K	
RV213	1-238-090-11	RES, ADJ, CERMET 10K	
RV502	1-238-095-11	RES, ADJ, CERMET 470K	
RV602	1-238-092-11	RES, ADJ, CERMET 47K	

(FLAT CABLE)

Ref. No.	Part No.	Description	Remark
W604	1-630-592-11	FP-184 FLEXIBLE BOARD	

(VIBRATOR)

Ref. No.	Part No.	Description	Remark
X201	1-577-117-21	OSCILLATOR, CRYSTAL 4.433619MHz	
X501	1-578-709-11	VIBRATOR, CRYSTAL 5.85938MHz	
X601	1-577-349-21	OSCILLATOR, CRYSTAL 16MHz	

****

MISCELLANEOUS
****

Ref. No.	Part No.	Description	Remark
⚠V901	1-452-566-11	CRT ASSY (M01KKX07WB10)	
	1-537-295-31	TERMINAL BOARD, LITIUM	
	1-542-126-11	MICROPHONE UNIT	
	1-547-445-11	FILTER BLOCK, OPTICAL	
	1-547-516-11	LENS, ZOOM (VCL-6210WA)	
	1-569-347-11	CONNECTOR, FPC(TRANSLATION)13P	
	1-572-496-11	SWITCH, PUSH (ZOOM SWITCH UNIT)	
	1-580-327-11	JACK ASSY, PIN (E, Australian MODEL)	
	1-580-327-21	JACK ASSY, PIN (AEP, UK MODEL)	

Ref. No.	Part No.	Description	Remark
165	1-547-445-11	FILTER BLOCK, OPTICAL	
⚠V901	1-452-566-11	CRT ASSY (M01KKX07WB10)	
IC901	8-752-607-39	IC ICX045BKA-2 (CCD IMAGER)	

****

ACCESSORIES & PACKING MATERIALS

****

Ref. No.	Part No.	Description	Remark
	1-465-934-11	REMOTE COMMANDER (CAM CORDER)(RMT-504)	
	1-571-164-11	SWITCH, ANTENNA CHANGE (CABLE)(UK,E)	
	3-701-625-00	BAG, POLYETHYLENE	
	3-704-281-01	BAG, PROTECTION (STANDARD)	
	3-712-673-01	SCREWDRIVER (UK,E)	
	3-738-517-01	BELT, SHOULDER	
	3-753-980-61	MANUAL, INSTRUCTION (ENGLISH) (E,Australian)	
	3-753-980-71	MANUAL, INSTRUCTION (FRENCH, GERMAN, SPANISH)(E)	
	3-753-980-81	MANUAL, INSTRUCTION (CHINESE)(E)	
	3-753-980-91	MANUAL, INSTRUCTION (ARABIC)(E)	
	3-754-687-11	MANUAL, INSTRUCTION (ENGLISH) (AEP,UK)	
	3-754-687-41	MANUAL, INSTRUCTION (FRENCH, GERMAN, SPANISH)(AEP)	
	3-754-687-51	MANUAL, INSTRUCTION (DUTCH, SWEDISH, ITALIAN)(AEP)	
	3-754-687-61	MANUAL, INSTRUCTION (PORTUGUESE)(AEP)	
	3-754-687-71	MANUAL, INSTRUCTION (DANISH, FINNISH)(AEP)	
*	3-764-631-12	INSTRUCTION, DEW CONDENSATION	
*	3-941-637-01	CUSHION (UPPER)	
*	3-941-638-01	CUSHION (LOWER)	
*	3-943-154-11	HOLDER (B), REMOTE CONTROL	
*	3-948-241-11	INDIVIDUAL CARTON	
	A-6767-706-A	RFU ADAPTOR (RFU-89EA)(E)	
	A-6767-707-A	RFU ADAPTOR (RFU-89EA)(UK)	
	A-6768-254-A	RFU ADAPTOR (RFU-90E)(AEP)	
	A-6768-255-A	RFU ADAPTOR (RFU-90AS)(Australian)	
**	AC-V35/V35A	AC POWER ADAPTOR	
***	NP-55	BATTERY PACK	

Note.

** MARK PARTS IS AVAILABLE FOR REPAIR SERVICE.
*** MARK PARTS IS AVAILAVLE AS AN OPTIONAL ACCESSORY.

****

HARDWARE LIST

****

Ref. No.	Part No.	Description	Remark
#1	7-627-553-37	PRECISION SCREW +P 2X3 TYPE 3	
#2	7-627-553-68	SCREW, PRECISION +P 2X6 TYPE3	
#3	7-621-283-10	SCREW +P 2X10	
#4	7-627-555-88	SCREW (M1.4X1.8)	
#5	7-627-853-57	PRECISION SCREW +P 2X5 TYPE3	

SECTION 7
CAMERA ADJUSTMENTS

During the adjustment, see the arrangement diagram for adjustment parts from page 232.

7-1. PRE-ADJUSTMENT PREPARATIONS (CAMERA BLOCK)

7-1-1. List of Servicing Jigs

- Oscilloscope
- Adjusting screwdriver
- Regulated power supply (2 units)
- Color monitor
- Vectorscope
- Stop watch
- Digital voltmeter

Ref. No.	Part Name	Part No.	Use
J-1	Filter (C14) for color temperature correction	J-6080-058-A	Auto white balance adjustment/confirmation Outdoor white balance adjustment/confirmation
J-2	ND filter 1.0	J-6080-808-A	Max. gain adjustment (two filters used)
	ND filter 0.4	J-6080-806-A	Iris adjustment, Hall in/out adjustment (two used), Max. gain adjustment
	ND filter 0.1	J-6080-807-A	Iris adjustment, Hall in/out adjustment
J-3	Pattern box PTB-500	J-6029-140-A	
J-4	Pattern box color chart	J-6020-250-A	
J-5	Siemens star	J-6080-875-A	For flange back adjustment
J-6	AF microprocessor data reading jig	J-6082-025-A	
J-7	Adjustment remote commander (RM-95 Modification)	J-6082-053-A	
J-8	Extension cord (16P)	J-6082-062-A	Extension cord for cabinet R (during operation)
	Extension cord (14P)	J-6082-061-A	Extension cord for CD-75P board (when repairing VC-117 board)
	Extension cord (20P)	J-6082-063-B	Extension cord for LD-54P board (when repairing VC-117 board)
			Extension cord for TI-41P board (when repairing TI-41P board)
J-9	Extension cord (10P)	J-6082-064-A	Extension cord for JK-67P board (when repairing VS-91 board)
J-10	Extension cord (3P)	J-6082-041-A	Extension cord for cabinet R (during operation)

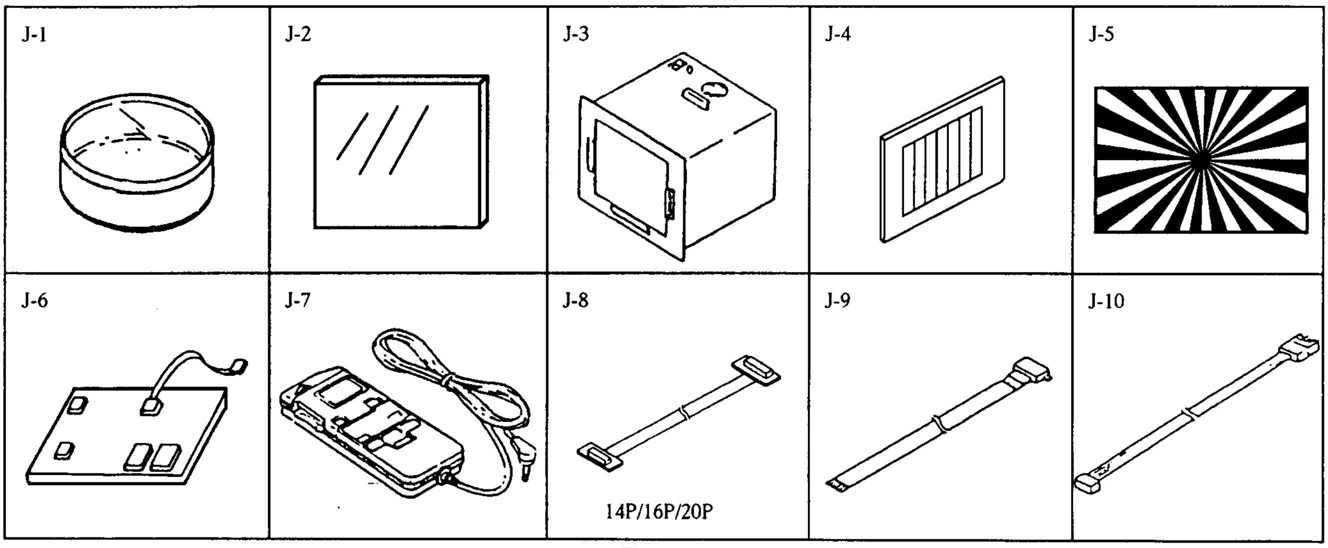


Fig. 7-1.

7-1-2. Preparations

Note: Refer to "2. DISASSEMBY" for details on removal of the cabinet and various boards.

1) Connect the various devices for adjustment as shown in Fig. 7-3.
2) The EVF (electronic viewfinder) is needed for confirmation of the white balance mode and shutter speed. Remove CN205 on the VS-91 board when the EVF is not needed.
3) The mic amplifier (MA-135 board) is not needed. Remove CN402 on the AU-132 board.
4) The LCD block is not needed. Remove CN806 on the VC-117 board.

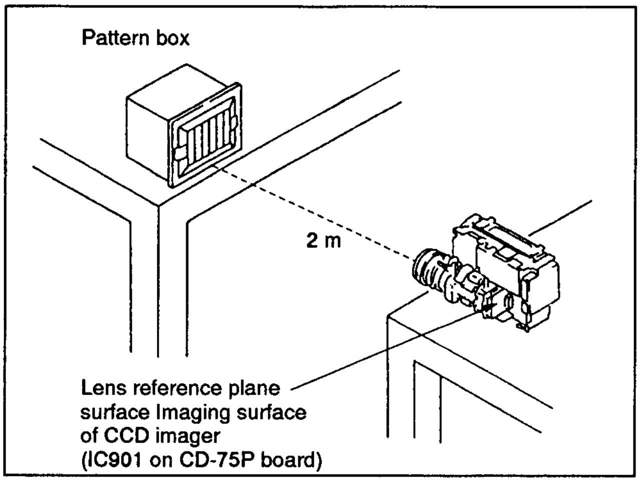
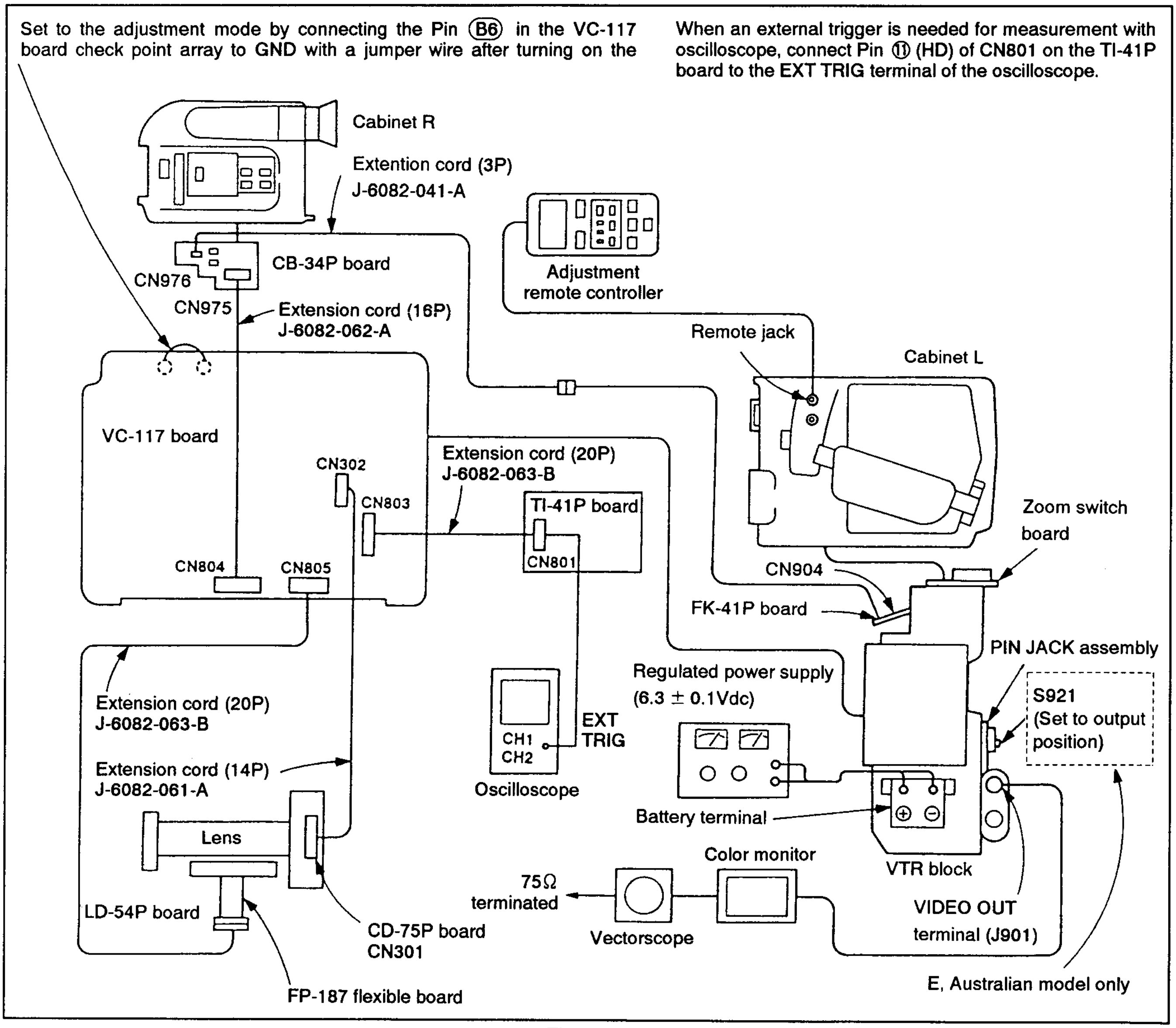

Pattern box
2 m
Lens reference plane surface Imaging surface of CCD imager
(IC901 on CD-75P board)

Fig. 7-2.



Set to the adjustment mode by connecting the Pin (B6) in the VC-117 board check point array to GND with a jumper wire after turning on the

When an external trigger is needed for measurement with oscilloscope, connect Pin ⑪ (HD) of CN801 on the TI-41P board to the EXT TRIG terminal of the oscilloscope.

Cabinet R
Extention cord (3P)
J-6082-041-A
CB-34P board
CN976
CN975
Extension cord (16P)
J-6082-062-A
Adjustment remote controller
Remote jack
Cabinet L
VC-117 board
CN302
CN803
Extension cord (20P)
J-6082-063-B
TI-41P board
CN801
CN804
CN805
Zoom switch board
CN904
FK-41P board
PIN JACK assembly
S921
(Set to output position)
Regulated power supply
(6.3 ± 0.1Vdc)
Extension cord (20P)
J-6082-063-B
EXT TRIG
CH1
CH2
Oscilloscope
Extension cord (14P)
J-6082-061-A
Battery terminal
Lens
Color monitor
VTR block
75Ω terminated
LD-54P board
VIDEO OUT terminal (J901)
CD-75P board
CN301
Vectorscope
FP-187 flexible board
E, Australian model only

Fig. 7-3.

7-1-3. Precautions

1. Setting of switches

Unless otherwise specified, the switches are set to the following positions and adjustment is made without a cassette inserted.

1. Camera/video power switch (S901 on FK-41P board) ......CAMERA
2. Standby switch (S921 on SW-158P board)......STANDBY
3. Auto-lock switch (S756 on CF-23P board)......OFF
4. White balance button (S757 on CF-23P board) ...... ☼ (indoors white balance mode)
5. Shutter speed button (S760 on CF-23P board) ......NORMAL (1/50)
6. Input/output select switch (S921 on PIN JACK assembly) ......OUTPUT ※ E, Australian model only
7. Back-light correction button (S758 on CF-23P board)......OFF

2. Adjustment order

As a rule, the adjustments are performed in the listed order.

3. Subjects

1) Color bar chart (standard picture frame)
   When performing adjustment using the color bar chart, adjust the picture frame shown in Fig. 7-4. (standard picture frame).
2) White pattern (standard picture frame)
   Remove the color bar chart from the pattern box and use the zoom lever so that the white pattern has the same size and is in the same position as the color bar chart (standard picture frame).

Color bar chart standard picture frame

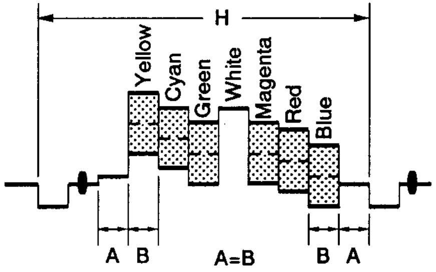


Fig. a (Video input/output terminal output waveform)

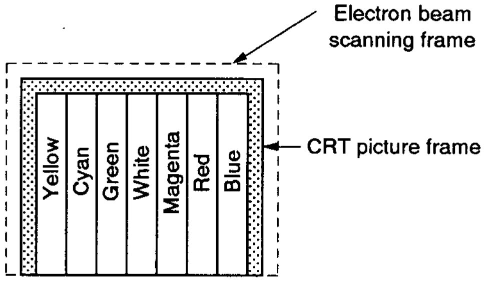


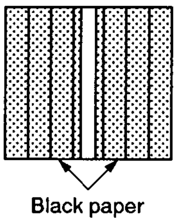
Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-4.

3) All white pattern
   Remove the color bar chart from the pattern box and set the zoom lever fully to the TELE (62 mm) side.
4) High luminance pattern
   Create the high luminance pattern as shown in Fig. 7-5., and adjust for the picture frame shown in Fig. 7-6.
5) Siemens star (J-6080-875-A)
   Adjust the direction of the camera so that center of the Siemens star is lined up with the center of the monitor screen on the monitor TV screen.

High luminance pattern



Attach black paper over all sections of the pattern except for half of the white bar of the color bar chartt. Display the picture on the monitor with the standard picture frame.

Fig. 7-5.

High luminance pattern

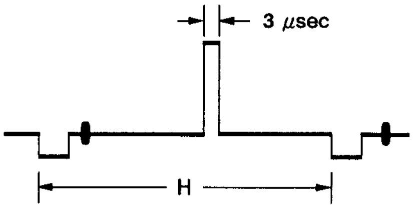


Fig. a (Video input/output terminal output waveform)

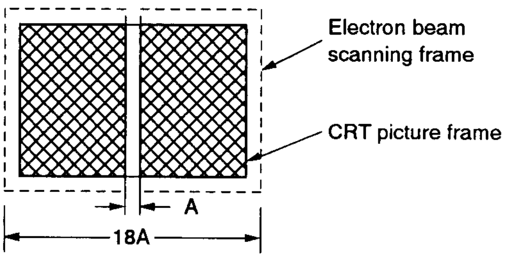


Fig. b (Picture on monitor TV)

Adjust the zooming and direction of the camera to obtain the output waveform shown in Fig. a and the monitor TV picture shown in Fig. b.

Fig. 7-6.

7-1-4. Adjustment Remote Controller

An EVR (electronic variable resistor) is used as the adjustment element for the camera block, replacing the conventional semi-fixed resistor. The EVR is controlled by the EVR/AWB microprocessor (IC361 on VC-117 board). This microprocessor reads the data written in the nonvolatile memory of the microprocessor and sends it to the EVR. The EVR D-A converts this data (8 bits for each adjustment point) and creates the adjustment voltage.

Thus, it is necessary to change the adjustment data contained in the nonvolatile memory when adjusting the camera block, and the adjustment memory is used for this purpose.

The adjustment remote controller performs bidirectional communications with the camera block microprocessor using the remote control signal lines (LANC). Adjustment addresses and adjustment data increment/decrement commands are sent to the camera block microprocessor from the adjustment remote controller. Adjustment addresses and adjustment data are sent from the camera block microprocessor to the adjustment remote controller.

1. Use of adjustment remote controller

Solder the lead wire to Pin (B6) (refer to 7-1-5.) of the check point array on the VC-117 board.

1) Connect the adjustment remote controller to the remote terminal (J941 on SW-158P board). (Set the HOLD switch of the adjustment remote controller to the HOLD position (SERVICE position).)
2) Turn on the power of the main unit.
3) Connect Pin (B6) ($\overline{\text{CAM ADJ}}$) of the check point array to GND using a jumper wire.
   (This connection causes the EVR/AWB microprocessor to cease normal remote control operation and to begin adjustment dedicated communications.)
   Note: Be sure to make this connection only after turning on the power. The following will be displayed on the LCD of the adjustment remote controller if the connection is normal. (Adjustment data varies according to the unit.)

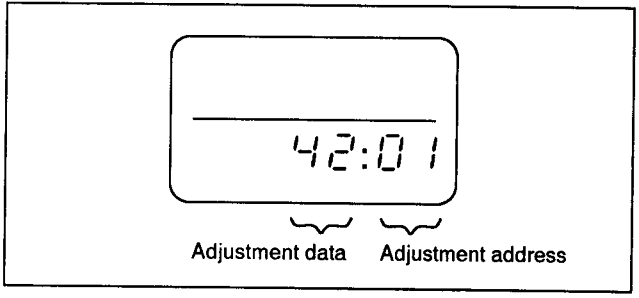


Fig. 7-7.

4) Designate the desired adjustment address using the adjustment remote controller. The adjustment address is incremented by pressing the FF (▶▶) button and decremented by pressing the REW (◀◀) button. (The adjustment address is indicated in hexadecimal, and there are 117 addresses from 01 to 75. The adjustment address corresponds to the EVR (IC252, IC302, IC611 on VC-117 board) output terminals. Refer to Table 7-3. for the adjustment contents of the various addresses.)
5) Perform adjustment by incrementing or decrementing the adjustment data.
   The adjustment data is incremented by pressing the PLAY (▶) button. The adjustment data is decremented by pressing the STOP (■) button.
   - The adjustment data is indicated in hexadecimal. There are 256 values from 00 to FF.

Hexadecimal	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
LCD Indication	0	1	2	3	4	5	6	7	8	9	A	b	c	d	E	F
Decimal equivalent	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

Table 7-1.

   - The adjustment data corresponds to the EVR (IC252, IC302, IC611 on VC-117 board) output voltage, and is as follows.

Adjustment data ( ) is decimal equivalent	EVR output voltage
FF (=255)	Maximum value (approx. 5 Vdc)
↑ F0 (=240)	↑
E0 (=224)	
D0 (=208)	
C0 (=192)	
B0 (=176)	
A0 (=160)	
90 (=144)	
80 (=128)	Center value (approx. 2.5 Vdc)
70 (=112)	
60 (=96)	
50 (=80)	
40 (=64)	
30 (=48)	
20 (=32)	
↓ 10 (=16)	↓
00 (=0)	Minimum value (approx. 0 Vdc)

Table 7-2.

6) The adjustment address is changed using the FF (▶▶) button or REW (◀◀) button to store the adjustment data in the nonvolatile memory of EVR/AWB microprocessor (IC361 on VC-117 board).
   (The new adjustment data is not stored in the nonvolatile memory unless this operation is performed.)

2. Precautions on use of adjustment remote controller

It is possible to accidentally erase correct adjustment data due to an error in operation of the adjustment remote controller. In order to prevent this, we recommend that you make a note of all adjustment data before adjustment and record the new adjustment data after completing each adjustment item.

Note: Data already described in the adjustment data memo column are fixed data.

Adjustment adderss	Adjustment voltage output terminal	Adjustment item	Remarks	Adjustment data memo column
01	Pin ⑱ of IC252	DELTA R	Auto white balance adjustment	
02	Pin ⑲ of IC252	DELTA B		
03	Pin ② of IC252	FADER	Input FF in fader level adjustment	00
04	Pin ③ of IC252	C PED		A0
05	Pin ④ of IC252	R–Y GAIN	Color reproduction adjustment	
06	Pin ⑤ of IC252	B–Y GAIN		
07	Pin ⑥ of IC252	R–Y HUE		
08	Pin ⑦ of IC252	B–Y HUE		
09	Pin ⑧ of IC252	C LEVEL	Chroma level adjustment	
0A	Pin ⑨ of IC252	TITLE Y	Title Y level adjustment	
0B	Pin ⑫ of IC252	R GAIN	Indoor white balance adjustment	
0C	Pin ⑬ of IC252	B GAIN		
0D	Pin ⑱ of IC302	C1 GAIN	Chroma signal matrix adjustment (1)	
0E	Pin ⑲ of IC302	Y1 GAIN	Y signal matrix adjustment	
0F	Pin ② of IC302	FADER LEVEL		
10	Pin ③ of IC302	BURST LEVEL		
11	Pin ④ of IC302	HUE CONT	Burst phase adjustment	—
12	Pin ⑤ of IC302	SYNC LEVEL		
13	Pin ⑥ of IC302	SET UP		
14	Pin ⑦ of IC302	WHITE CLIP (WC)		
15	Pin ⑧ of IC302	Y LEVEL		
16	Pin ⑨ of IC302	APERTURE		
17	Pin ⑫ of IC302	YH GAIN		
18	Pin ⑬ of IC302	C2 GAIN	Chroma signal matrix adjustment (2)	
19	Pin ⑱ of IC611	IRIS		
1A			Not used	—
1B	Pin ② of IC611	HALL OFFSET	Hall adjustment	
1C	Pin ③ of IC611	MAX GAIN		
1D	Pin ④ of IC611	AGC		
1E	Pin ⑤ of IC611	V SUB		
1F			Not used	—
20	Pin ⑦ of IC611	PG CONT		
21	Pin ⑧ of IC611	TITLE TH	Title A/D level adjustment	
22	Pin ⑨ of IC611	ZOOM L SPD	Power zoom speed fixed data	44
23	Pin ⑫ of IC611	ZOOM H SPD		44
24	Pin ⑬ of IC611	FOCUS SPEED		

Table 7-3. (1)

<table>
<tr><th>Adjustment adderss</th><th>Adjustment voltage output terminal</th><th>Adjustment item</th><th colspan="2">Remarks</th><th>Adjustment data memo column</th></tr>
<tr><td>25</td><td></td><td>MODE</td><td colspan="2">The following adjustment modes are selected by changing the adjustment data.
<table>
<tr><th>Adjustment data</th><th>Adjustment mode</th></tr>
<tr><td>00</td><td>Release</td></tr>
<tr><td>01</td><td>Focus hunching</td></tr>
<tr><td>03</td><td>Zoom position</td></tr>
<tr><td>05</td><td>Hall, iris close</td></tr>
<tr><td>07</td><td>Hall, iris open</td></tr>
<tr><td>09</td><td>Hall in/out threshold</td></tr>
<tr><td>0B</td><td>Auto-focus AGC</td></tr>
<tr><td>FD</td><td>Auto-focus filter fixed at FA</td></tr>
<tr><td>FF</td><td>Auto-focus filter fixed at FH</td></tr>
</table></td><td>00</td></tr>
<tr><td>26</td><td></td><td>FG REF</td><td colspan="2"></td><td>36</td></tr>
<tr><td>27</td><td></td><td>MACRO</td><td colspan="2"></td><td></td></tr>
<tr><td>28</td><td></td><td>IN OUT DOOR</td><td colspan="2"></td><td>1A</td></tr>
<tr><td>29</td><td></td><td>BACK RUSH</td><td colspan="2"></td><td>31</td></tr>
<tr><td>2A</td><td></td><td>BASE-H</td><td colspan="2"></td><td>20</td></tr>
<tr><td>2B</td><td></td><td>LC-THR</td><td colspan="2"></td><td>10</td></tr>
<tr><td>2C</td><td></td><td>SEARCH</td><td colspan="2"></td><td>12</td></tr>
<tr><td>2D</td><td></td><td>HALL OUT</td><td colspan="2" rowspan="2">Hall in/out adjustment</td><td></td></tr>
<tr><td>2E</td><td></td><td>HALL IN</td><td></td></tr>
<tr><td>2F</td><td></td><td>STILL THR1</td><td colspan="2"></td><td>02</td></tr>
<tr><td>30</td><td></td><td>STILL THR2</td><td colspan="2"></td><td>02</td></tr>
<tr><td>31</td><td></td><td>STILL THR3</td><td colspan="2"></td><td>01</td></tr>
<tr><td>32</td><td></td><td>FH W</td><td colspan="2"></td><td></td></tr>
<tr><td>33</td><td></td><td>FH B</td><td colspan="2"></td><td></td></tr>
<tr><td>34</td><td></td><td>AGC W</td><td colspan="2"></td><td></td></tr>
<tr><td>35</td><td></td><td>AGC B</td><td colspan="2"></td><td></td></tr>
<tr><td>36</td><td></td><td>ZOOM THR</td><td colspan="2"></td><td>18</td></tr>
<tr><td>37</td><td></td><td>IRIS THR</td><td colspan="2"></td><td>18</td></tr>
<tr><td>38</td><td></td><td>V PULSE</td><td colspan="2"></td><td>68</td></tr>
<tr><td>39</td><td></td><td>R32MSB</td><td colspan="2" rowspan="6">3200K preset data
(The data written in this column are inputted automatically when performing the auto white balance adjustment.)</td><td></td></tr>
<tr><td>3A</td><td></td><td>R32LSB</td><td></td></tr>
<tr><td>3B</td><td></td><td>B32MSB</td><td></td></tr>
<tr><td>3C</td><td></td><td>B32LSB</td><td></td></tr>
<tr><td>3D</td><td></td><td>G32MSB</td><td></td></tr>
<tr><td>3E</td><td></td><td>G32LSB</td><td></td></tr>
<tr><td>3F</td><td></td><td>START R</td><td rowspan="2">R CONT and B CONT data when starting the auto white balance operation.</td><td rowspan="2">Auto white balance adjustment</td><td></td></tr>
<tr><td>40</td><td></td><td>START B</td><td></td></tr>
<tr><td>41</td><td></td><td>TM DIVID</td><td rowspan="2">Border value of the tracking frame</td><td rowspan="3">Auto white balance fixed data</td><td>44</td></tr>
<tr><td>42</td><td></td><td>BM DIVID</td><td>28</td></tr>
<tr><td>43</td><td></td><td>TOP SLP R</td><td>R CONT coefficient of the upper step of the tracking frame</td><td>80</td></tr>
</table>

Table 7-3. (2)

Adjustment adderss	Adjustment voltage output terminal	Adjustment item	Remarks		Adjustment data memo column
44		TOP SLP B	B CONT coefficient of the upper step of the tracking frame	Auto white balance adjustment	
45		MDL SLP R	R CONT and B CONT coefficient of the middle step of the tracking frame	Auto white balance fixed data	4B
46		MDL SLP B			40
47		BTM SLP R			30
48		BTM SLP B			50
49		KEIKO R			50
4A		KEIKO B			20
4B		TOP UP	Upper and lower limit frames of the upper step of the tracking frame	Auto white balance adjustment	
4C		TOP DWN			
4D		MDL UP	Upper and lower limit frames of the upper, middle and lower steps of the tracking frame	Auto white balance fixed data	85
4E		MDL DWN			70
4F		BTM UP			6E
50		BTM DWN			53
51		KEIKO DWN			58
52		R DWN LMT	R CONT data upper and lower limit of the tracking frame		21
53		R UP LMT			69
54		B UP LMT	B CONT data upper limit of the tracking frame	Auto white balance adjustment	
55		IN BTOP	INDOOR operation frame upper limit of the tracking frame		
56		IN BMAX	B CONT data upper limit of INDOOR mode		
57		OUT BMIN	B CONT data lower limit of OUTDOOR mode		
58		OUT BTM	OUTDOOR mode operation frame lower limit of the tracking frame		
59		B DWN LMT	B CONT data lower limit of the tracking frame	Auto white balance fixed data	10
5A		R OUTDOOR	White balance preset data	Auto white balance adjustment	
5B		B OUTDOOR			
5C		Ra	R CONT and B CONT data of the points a, b and c on the curve of blackbody radiation		
5D		Rb			
5E		Rc			
5F		Ba			
60		Bb			
61		Bc			
62		R/B TOP	Slope data of the curve of blackbody radiation		
63		R/B MDL			
64		R/B BTM			
65		B/R TOP			
66		B/R MDL			
67		B/R BTM			

Table 7-3. (3)

Adjustment adderss	Adjustment voltage output terminal	Adjustment item	Remarks		Adjustment data memo column
68		KEIKO	Indoor AWB data	Auto white balance fixed data	60
69		LL LMT	Minimum tracking illuminance		08
6A		B HUE KEI	Variable linear matrix data		00
6B		R GAIN OFF			00
6C		R GAIN KEI			00
6D		R HUE OFF			00
6E		R HUE KEI			00
6F		DELAY TM	Tracking speed		0C
70		FAST TM	Initial high speed tracking times		30
71		CAM DDS O	Fixed data		00
72		MODE			88
73		DSP MODE			00
74		CAM ALN			00
75		AWB MODE	The following adjustment modes are selected by changing the adjustment data.		00

Adjustment data	Adjustment mode
00	Release, factory setting
10	Auto white balance adjustment mode
E0	3200K preset data read mode
F0	Auto white balance tracking zone discrimination invalid. All area discrimination mode.

Table 7-3. (4)

7-1-5. Check Point Array

Almost all of the measurement points for camera block adjustment are located in the check point array on the VC-117 board. Solder short lead wires onto the terminals needed for adjustment and connect an oscilloscope, etc.
The terminal numbers and signal names for the check point array are shown in Table 7-4.

Terminal No.	Signal Name	Terminal No.	Signal Name
A1	G OUT	B1	N.C
A2	PG CONT	B2	N.C
A3	N.C	B3	Y (LPF) OUT
A4	Y0	B4	V SUB
A5	Y1	B5	AW ADJ
A6	C0	B6	$\overline{\text{CAM ADJ}}$
A7	C1	B7	OFF SET CONT
A8	CAM Y	B8	N.C
A9	YH	B9	N.C
A10	CAM C	B10	GND
A11	IRIS CONT	B11	IRIS DET

* N.C......no connection

Table 7-4.

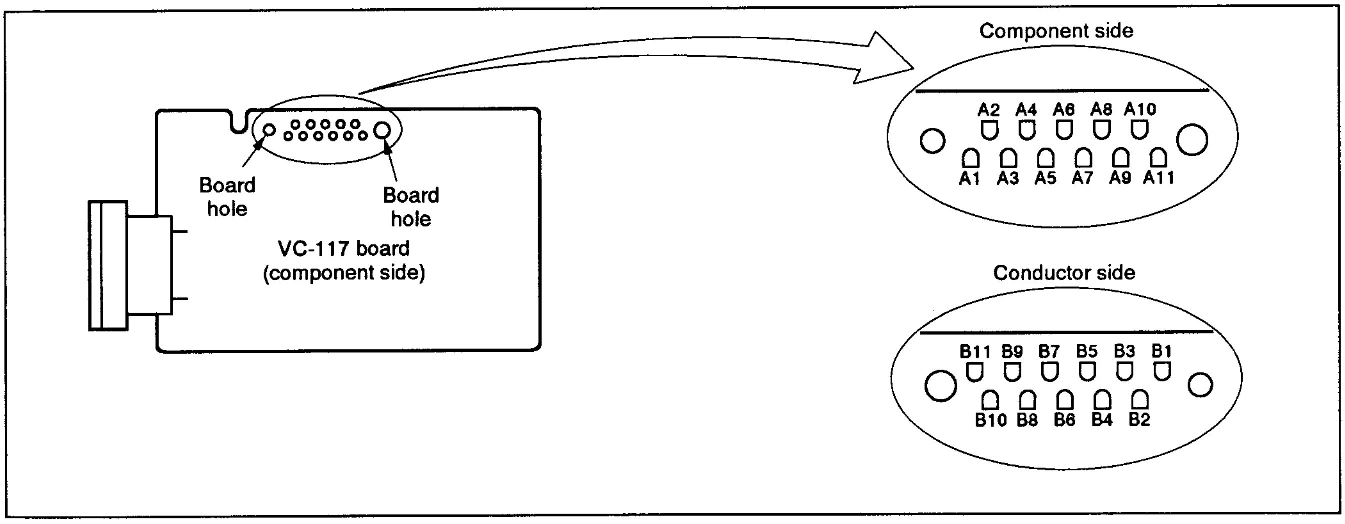

Component side
A2 A4 A6 A8 A10
A1 A3 A5 A7 A9 A11
Board hole
Board hole
VC-117 board (component side)
Conductor side
B11 B9 B7 B5 B3 B1
B10 B8 B6 B4 B2

Fig. 7-8.

7-1-6. AF Microprocessor Data Reading Jig

The AF microprocessor data reading jig converts the serial data (output data varies according to hall (iris) state, focus state, focus motor speed, zoom ring position, etc.) for adjustment output from the AF microprocessor (IC613 on VC-117 board) into a 2-digit hexadecimal code and displays it on the LED.

Connections:
Connect as shown in the diagram below.

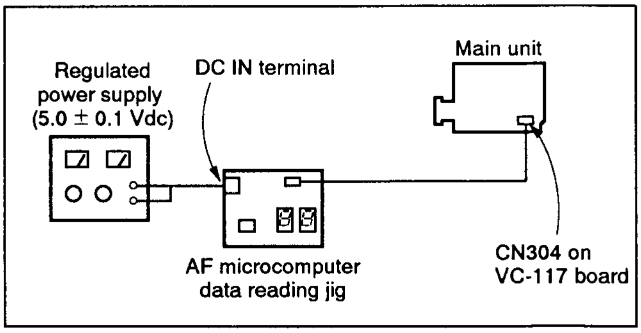

Regulated power supply (5.0 ± 0.1 Vdc)
DC IN terminal
Main unit
AF microcomputer data reading jig
CN304 on VC-117 board

Fig. 7-9.

7-1-7. Data Processing

For some of the adjustment items, calculation from the data (hexadecimal) indicated on the AF microprocessor data reading jig and adjustment remote controller is needed to obtain the adjustment data. In these cases, convert the hexadecimal values to decimal before calculation and reconvert the result to hexadecimal to obtain the adjustment data. A hexadecimal — decimal conversion table is shown in Table 7-5.

Hexadecimal-Decimal Conversion Table

Hexadecimal lower digit / Hexadecimal upper digit	0	1	2	3	4	5	6	7	8	9	A (A)	B (b)	C (c)	② D (d)	E (E)	F (F)
0	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
2	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47
3	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63
4	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
5	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95
6	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111
7	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127
8	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143
9	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159
A(A)	160	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175
① → B(b)	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191
C(c)	192	193	194	195	196	197	198	199	200	201	202	203	204	205	206	207
D(d)	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223
E(E)	224	225	226	227	228	229	230	231	232	233	234	235	236	237	238	239
F(F)	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255

Note: ( ) is the indication on the jig or adjustment remote commander.

Example: The indication on the jig or adjustment remote commander is BD (b d).
As the upper digit is B (b) and the lower digit is D (d), a decimal value of 189 is obtained from the intersection of ① and ② in the above table.

Table 7-5.

7-2. CAMERA SYSTEM ADJUSTMENTS

7-2-1. Flange Back Adjustment

Subject	Siemens star (2 m directly in front of lens reference plane (CCD imager))
Measurement Point	Check with a monitor TV
Measuring Instrument	
Adjusting Element	Flange back adjusting pin
Tools	Phillips screwdriver, flat blade (–) screwdriver

Adjusting method:

1) Press the FOCUS switch (S759 on CF-23P board) to set to the MANUAL mode.
2) Position a Siemens star 2 m directly in front of the lens reference plane (See Fig. 7-2.).
3) Orient the camera block to have the center of the Siemens star imaged on the monitor TV screen coincide with the monitor screen center.
4) Check to assure the smooth motion of the lens zoom lever to both its extreme WIDE position (6.2 mm) and TELE position (62 mm), and then set it at the extreme WIDE position. (In this process, also check the monitor image to assure proper zooming operation.)
5) Select adjustment address 25 with the adjustment remote controller and enter adjustment data of 07. (Iris open mode) At this time, adjust the illumination on the Siemens star or place an ND filter over the lens, and confirm that the proper image is displayed on the monitor TV screen.
6) Set the lens focusing mark at the center of "2".

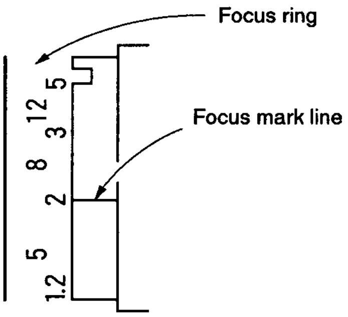


Fig. 7-10.

7) Loosen flange back setscrew ❶ with a Phillips screwdriver. (See Fig. 7-12.)
8) By turning the flange back adjusting Pin ❷ while watching the monitor screen, attain the optimum definition of a wedge at the Siemens star center on the screen. (Turn it a few turns to the left and right to ensure optimum definition.)
   Note: Do not turn the adjusting pin excessively in either direction.
9) While holding the flange back adjusting Pin ❷ to prevent further rotation, retighten the flange back setscrew ❶.
10) With the zoom lever fixed at its WIDE end, turn the focusing ring and set it to the position that provides the optimum definition image of the wedge. Check to assure the focusing mark protrusion position is within the range shown in Fig. 7-11. Also, rotate the focusing ring to the close (1.2 m) and far (∞) extremes and confirm that the wedge is no longer in focus.

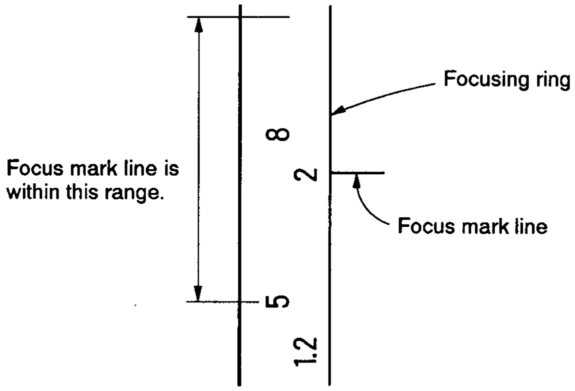


Fig. 7-11.

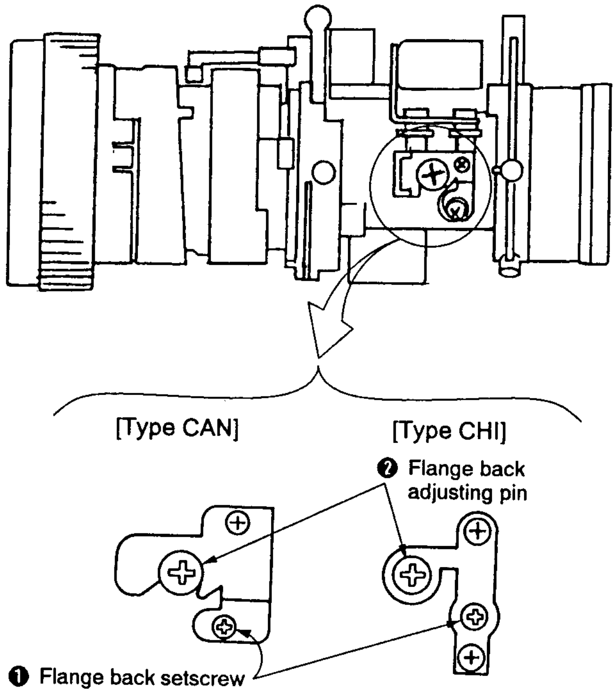


Fig. 7-12.

11) Fix the zoom lever at the extreme TELE position.
12) Turn the focusing ring and stop at the position where the wedge has optimum definition.
    Confirm that the focus mark is within ± 1.5 mm of "2".
13) Select adjustment address 25 with the adjustment remote controller and enter adjustment data of 00. (Iris normal)
14) Change the adjustment address to store the adjustment data in the memory.

7-2-2. Power Supply Adjustment

1 Power Supply Check (VC-117 Board)

Measuring Instrument	Digital voltmeter
CAM 5V Check	
Measurement Point	Pin ④ of W801
Specified Value	4.90 ± 0.05 Vdc
23V Check	
Measurement Point	Pin ① of W801
Specified Value	23.08 ± 0.50 Vdc
15V Check	
Measurement Point	Pin ② of W801
Specified Value	15.0 ± 0.5 Vdc
− 9V Check	
Measurement Point	Pin ③ of W801
Specified Value	−9.0 ± 0.5 Vdc

Checking method:

1) Confirm that each power supply voltage meet the specified value. If not, perform the power supply adjustment.

2 Power Supply Adjustment (DD-31P Board)

Measuring Instrument	Digital voltmeter
CAM 5V Adjustment	
Measurement Point	Pin ④ of CN103
Adjusting Element	RV102
Specified Value	4.90 ± 0.01 Vdc
CAM15V Adjustment	
Measurement Point	Pin ② of CN103
Adjusting Element	RV104
Specified Value	15.0 ± 0.03 Vdc

Adjusting method:

1) Adjust to the specified value with the corresponding adjusting elements.

7-2-3. EVR Initial Settings

Set to the following initial settings of the adjustment data only when the EVR/AWB microprocessor (IC361 on VC-117 board) was replaced.

Adjustment address	Adjustment data initial value	Adjustment address	Adjustment data initial value	Adjustment address	Adjustment data initial value
01 (DELTA R)	50	2A (BASE H)	20	4E (MDL DWN)	70
02 (DELTA B)	50	2B (LC-THR)	10	4F (BTM UP)	6E
03 (FADER OUT)	00	2C (SEARCH)	12	50 (BTM DWN)	53
04 (C-PED)	A0	2F (STILL THR1)	02	51 (KEIKO DWN)	58
0F (FADER LEVEL)	A0	30 (STILL THR2)	02	52 (R DWN LMT)	21
12 (SYNC LEVEL)	90	31 (STILL THR3)	01	53 (R TOP LMT)	69
13 (SET UP)	A0	32 (FH W)	00	59 (B DWN LMT)	10
14 (WC)	FF	33 (FH B)	01	68 (KEIKO)	60
15 (Y LEVEL)	A0	34 (AGC W)	10	69 (LL LMT)	08
17 (YH GAIN)	FF	35 (AGC B)	3F	6A (B HUE KEI)	00
19 (IRIS)	FF	36 (ZOOM THR)	18	6B (R GAIN OFF)	00
1C (MAX GAIN)	C0	37 (IRIS THR)	18	6C (R GAIN KEI)	00
1D (AGC)	FF	38 (V PULSE)	68	6D (R HUE OFF)	00
1E (V SUB)	40	41 (TM DIVID)	44	6E (R HUE KEI)	00
20 (PG CONT)	A0	42 (BM DIVID)	28	6F (DELAY TM)	0C
21 (TITLE TH)	FF	43 (TOP SLP R)	80	70 (FAST TM)	30
22 (ZOOM L SPD)	44	45 (MDL SLP R)	4B	71 (CAM DDSO)	00
23 (ZOOM H SPD)	44	46 (MDL SLP B)	40	72 (MODE)	88
24 (FOCUS SPEED)	40	47 (BTM SLP R)	30	73 (DSP MODE)	00
26 (FG REF)	36	48 (BTM SLP B)	50	74 (CAM ALN)	00
27 (MACRO)	09	49 (KEIKO R)	50	75 (AWB MODE)	00
28 (IN/OUT DOOR)	1A	4A (KEIKO B)	20		
29 (BACK RUSH)	31	4D (MDL UP)	85		

Table 7-6.

Adjusting method:

1) Set the RV701 (HALL ADJ) on the LD-54P board to the mechanical center.
2) Set the adjustment data at the various adjustment addresses to the initial values using the adjustment remote controller.
3) Change the adjustment address to store the last adjustment data in the memory.

7-2-4. 28MHz Local Oscillation Adjustment (VC-117 Board)

Subject	Not needed
Measurement Point	Pin ㉘ of IC612
Measuring Instrument	Frequency counter
Adjustment Address	CT143
Specified Value	14.187500 ± 0.00007 MHz

Adjusting method:

1) Adjust CT143 so that the oscillating frequency is 14.187500 ± 0.00007 MHz.

7-2-5. PLL Adjustment (VC-117 board)

Subject	Not needed
Measurement Point	R152 side terminal of C152 or Pin ⑳ of IC141
Measuring Instrument	Digital voltmeter
Adjustment Element	CT142
Specified Value	2.5 ± 0.2 Vdc

Adjusting method:

1) Adjust to 2.5 ± 0.2 Vdc with CT142.

7-2-6. PG CONT and VSUB Adjustment

1. PG CONT adjustment (VC-117 board)

Subject	Not needed
Measurement Point	Pin (A2) (PG CONT) of check point array
Measuring Instrument	Digital voltmeter
Adjustment Address	20 (PG CONT)
Specified Value	(Voltage indicated by the imager) ± 0.1 Vdc

Adjusting method:

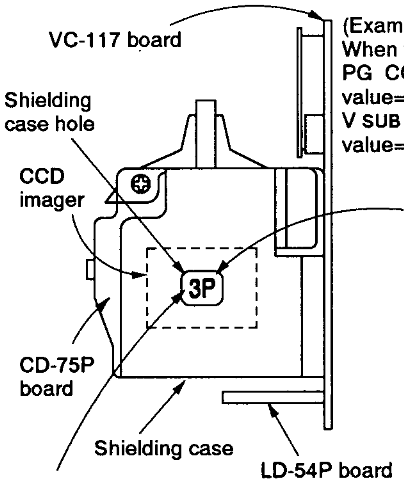
1) Change the adjustment data at adjustment address 20 using the adjustment remote controller to set the PG CONT voltage to (voltage indicated by the imager) ± 0.1 Vdc.
2) Change the adjustment address to store the adjustment data in the memory.

2. VSUB adjustment (VC-117 board)

Subject	Not needed
Measurement Point	Pin (B4) (V SUB) of check point array
Measuring Instrument	Digital voltmeter
Adjustment Address	1E (V SUB)
Specified Value	(Voltage indicated by the imager) ± 0.1 Vdc

Adjusting method:

1) Change the adjustment data at adjustment address 1E using the adjustment remote controller to set the VSUB voltage to (voltage indicated by the imager) ± 0.1 Vdc.
2) Change the adjustment address to store the adjustment data in the memory.



(Example)
When the indication is 3P;
PG CONT voltage specified value=2.0 ± 0.1 Vdc
V SUB voltage specified value=13.5 ± 0.1 Vdc

PG CONT voltage code

Code	Voltage (Vdc)
1	1.0
2	1.5
3	2.0
4	2.5
5	3.0
6	3.5
7	4.0

V SUB voltage code

Code	Voltage (Vdc)
E	9.0
F	9.5
G	10.0
H	10.5
J	11.0
K	11.5
L	12.0
M	12.5
N	13.0
P	13.5
Q	14.0
R	14.5
S	15.0
T	15.5
U	16.0
V	16.5
W	17.0
X	17.5
Y	18.0
Z	18.5

Fig. 7-13.

7-2-7. Hall Adjustment (LD-54P Board)

Subject	All black (cover lens with black cap)
Measurement Point	CN304 on the VC-117 board
Measuring Instrument	AF microprocessor data reading jig
Adjusment Address	1B (Hall Offset)
Adjusting Element	RV701
Specified Value	When iris closed: Minimum value of 01 to 04 When iris open: 3D or 3E

Preparations:

1) Prepare a 1 kΩ resistor for connecting Pin (A11) (IRIS CONT) of the check point array and CAM 5V (Pin ④ of W801).

Adjusting method:

1) Set RV701 to the mechanical center.
2) Set the adjustment address to 25 with the adjustment remote controller, and set the adjustment data to 05. At the same time, connect Pin (A11) of the check point array and CAM 5V using 1 kΩ resistance. (Setting when iris closed)
3) Change the adjustment address to 1B.
4) Change the adjustment data until the indication on the AF microprocessor data reading jig is the minimum value in the range of 01 to 04. (Hall offset adjustment)
5) Change the adjustment address to 25 and set the adjustment data to 07. At the same time, remove the 1 kΩ resistance at Pin (A11) of the check point array. (Setting when iris open)
6) Adjust RV701 until the indication on the AF microcomputer data reading jig is either 3D or 3E. (3D is indicated as 3 d .)
7) Repeat steps 2) through 6) until meet the specified values.
8) Set the adjustment address to 25 and set the adjustment data to 00. (Releases adjustment mode)
9) Change the adjustment address to store the adjustment data in the memory.

7-2-8. Iris Adjustment (VC-117 Board)

Subject	Color bar chart standard picture frame
Filter	ND filter 0.4 and 0.1
Measurement Point	Pin (B11) (CCD OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	19 (Iris)
Specified Value	150 ± 10 mVp-p

Adjusting method:

1) Set the adjustment address to 19 with the adjustment remote controller.
2) Without attaching an ND filter, change the adjustment data with the adjustment remote controller to set the IRIS OUT signal level to 150 ± 10 mVp-p.
3) Attach the ND filter 0.5 (0.4+0.1) to the front of the lens and confirm that there is a smooth change in the signal level.
4) Remove the ND filter and confirm that the signal level is 150 ± 10 mVp-p.
5) Repeat 2) through 4) if the specified value is not met.
6) Change the adjustment address to store the adjustment data in the memory.

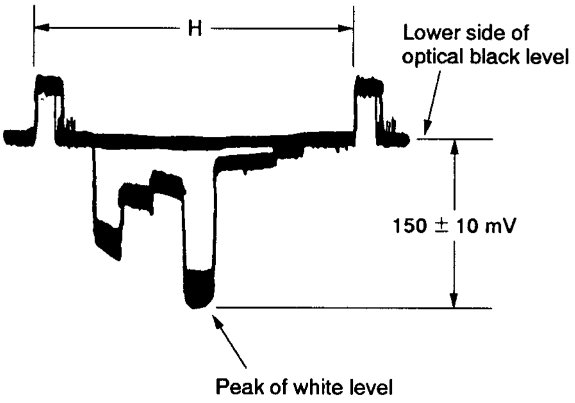


Fig. 7-14.

7-2-9. Hall In/Out Adjustment (VC-117 Board)

Subject	White pattern standard picture frame
Filter	ND filter 0.4 (two) and 0.1 (one)
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	2E (HALL IN) 2D (HALL OUT)

Adjusting method:

1) Cover the lens with the ND filter 0.8 (0.4+0.4).
2) Set the adjustment address to 25 with the adjustment remote controller and set the adjustment data to 09.
   (Hall in/out threshold mode setting)
3) Read the data indicated on the AF microprocessor data reading jig and set this data to the adjustment address 2E.
4) Remove the ND filter 0.8 and replace it with ND filter 0.5 (0.4+0.1).
5) Read the data indicated on the AF microprocessor data reading jig and set this data to the adjustment address 2D.
6) Change the adjustment address to 25 and set the adjustment data to 00. (Releases hall in/out threshold mode)
7) Change the adjustment address to store the adjustment data in the memory.

7-2-10. AGC Adjustment (VC-117 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin Ⓑ3 (Y (LPF) OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	1D (AGC)
Specified Value	160 ± 5 mVp-p

Adjusting method:

1) Set the adjustment address to 1D using the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the Y (LPF) signal level to 160 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

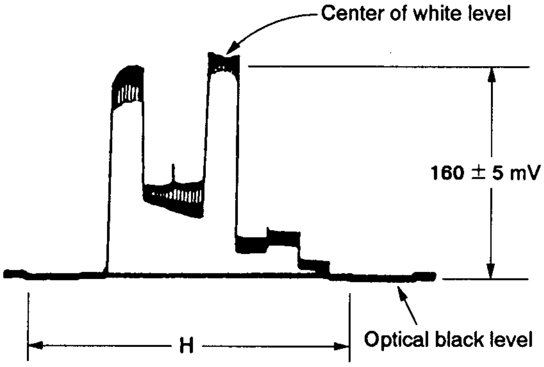


Fig. 7-15.

7-2-11. Y Signal Matrix Adjustment (VC-117 Board)

Subject	Color bar standard picture frame
Measurement Point	1: Pin (A4) (Y0) of check point array 2: Pin (A5) (Y1) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	0E (Y1 GAIN)
Specified Value	Y1 signal level=Y0 signal level

Note: Attach 10 kΩ registor to tip of the probe (10:1).

Adjusting method:

1) Connect the oscilloscope to Pin (A4) of the check point array and measure the Y0 signal level.
2) Connect the oscilloscope to Pin (A5) of the check point array.
3) Set the adjustment address to 0E using the adjustment remote controller.
4) Change the adjustment data until the Y1 signal level is the same as the Y0 signal level measured in 1).
5) Change the adjustment address to store the adjustment data in the memory.

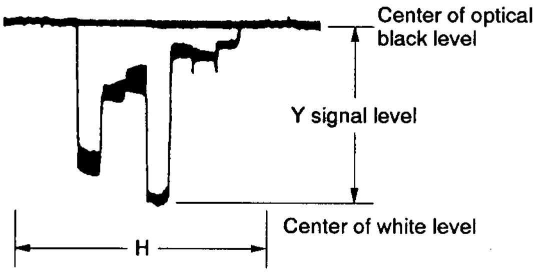


Fig. 7-16.

7-2-12. Chroma Signal Matrix Adjustment (1) (VC-117 Board)

Subject	Color bar standard picture frame
Measurement Point	1: Pin Ⓐ6 (C0) of check point array 2: Pin Ⓐ7 (C1) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	0D (C1 GAIN)
Specified Value	C1 signal level=C0 signal level

Note: Attach 10 kΩ registor to tip of the probe (10:1).

Adjusting method:

1) Connect the oscilloscope to Pin Ⓐ6 of the check point array and measure the C0 signal level. (The C0 signal level is the larger of the CR and CB signal levels.)
2) Connect the oscilloscope to Pin Ⓐ7 of the check point array.
3) Set the adjustment address to 0D using the adjustment remote controller.
4) Change the adjustment data until the C1 signal level is the same as the C0 signal level measured in 1).
5) Change the adjustment address to store the adjustment data in the memory.

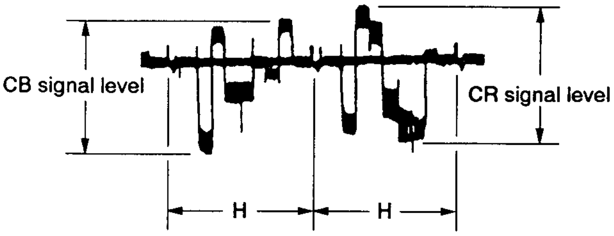


Fig. 7-17. C0 and C1 signal levels

7-2-13. Chroma Signal Matrix Adjustment (2) (VC-117 Board)

Subject	Color bar standard picture frame
Measurement Point	CH1 (X): emitter of Q257 (B–Y) CH2 (Y): emitter of Q255 (R–Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	18 (C2 GAIN)
Specified Value	Separate color luminance points become one.

Note: Adjustment can be made in the same manner using a vectorscope.
(Vectorscope connection terminal: video output terminal)

Adjusting method:

1) Set the adjustment address to 18 using the adjustment remote controller.
2) Change the adjustment data so that the two separate color luminance points become one respectively.
3) Change the adjustment address to store the adjustment data in the memory.

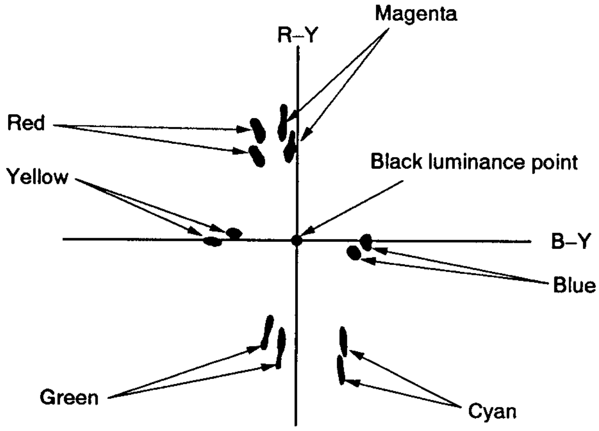


Fig. 7-18.

7-2-14. YH Level Adjustment (VC-117 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A9) (YH) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	17 (YH LEVEL)
Specified Value	900 ± 40 mVp-p

Adjusting method:

1) Set the adjustment address to 17 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the YH signal level to 900 ± 40 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

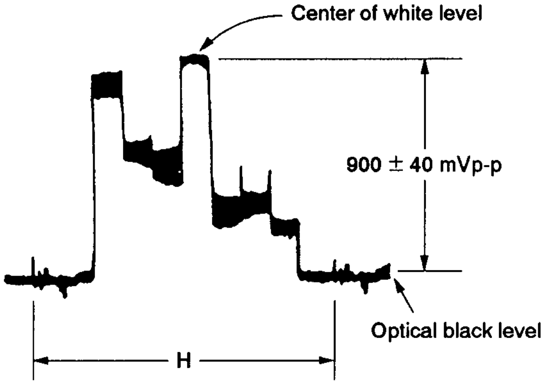


Fig. 7-19.

7-2-15. Sync Level Adjustment (VC-117 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A8)(CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	12 (SYNC LEVEL)
Specified Value	300 ± 5 mVp-p

Adjusting method:

1) Set the adjustment address to 12 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the sync level to 300 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

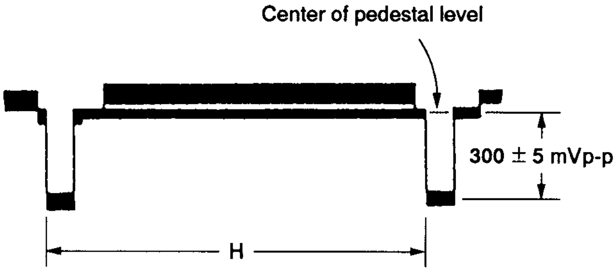


Fig. 7-20.

7-2-16. Setup Adjustment (VC-117 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A8)(CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	13 (SET UP)
Specified Value	35 ± 10 mV

Note: 1) and 2) are steps taken to reduce noise.

Adjusting method:

1) Set the address to 16 (APERTURE) with the adjustment remote controller, and enter 00 as the adjustment data after making a note of the adjustment data for this address.
2) Set the address to 1C (MAX GAIN) with the adjustment remote controller, and enter 00 as the adjustment data after making a note of the adjustment data for this address.
3) Set the adjustment address to 13 with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the setup level to 35 ± 10 mV.
5) Set the adjustment address to 16 and enter the adjustment data recorded in 1).
6) Set the adjustment address to 1C and enter the adjustment data recorded in 2).
7) Change the adjustment address to store the adjustment data in the memory.

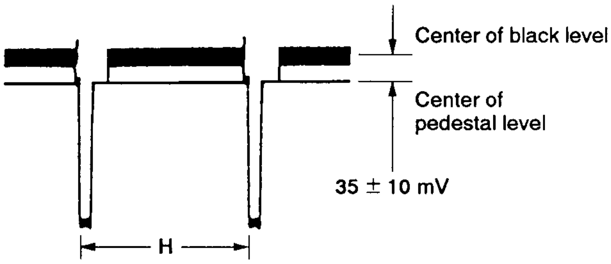


Fig. 7-21.

7-2-17. White Clip Adjustment (VC-117 Board)

Subject	High luminance pattern
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	14 (WHITE CLIP)
Specified Value	840 ± 20 mV

Adjusting method:

1) Set the adjustment address to 15 with the adjustment remote controller, and make a note of the adjustment data for this address.
2) Set the adjustment data to 40 with the adjustment remote controller.
3) Set the adjustment address to 14 with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the white clip level to 840 ± 20 mV.
5) Set the adjustment address to 15 and enter the adjustment data recorded in 1).
6) Change the adjustment address to store the adjustment data in the memory.

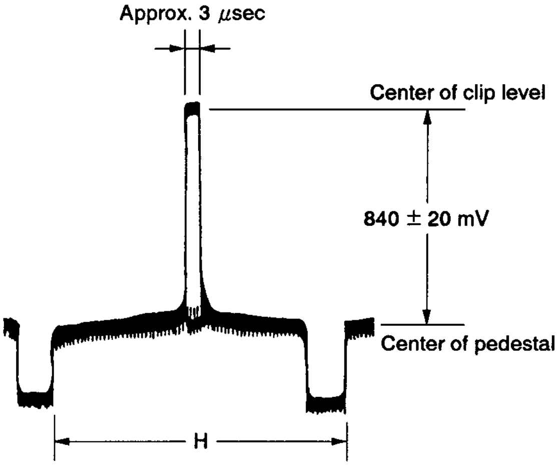


Fig. 7-22.

7-2-18. Y Level Adjustment (VC-117 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	15 (Y LEVEL)
Specified Value	640 ± 10 mV

Adjusting method:

1) Set the adjustment address to 14 with the adjustment remote controller, and make a note of the adjustment data for this address.
2) Set the adjustment data to FF with the adjustment remote controller.
3) Set the adjustment address to 15 with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the Y signal level to 640 ± 10 mV.
5) Set the adjustment address to 14 and enter the adjustment data recorded in 1).
6) Change the adjustment address to store the adjustment data in the memory.

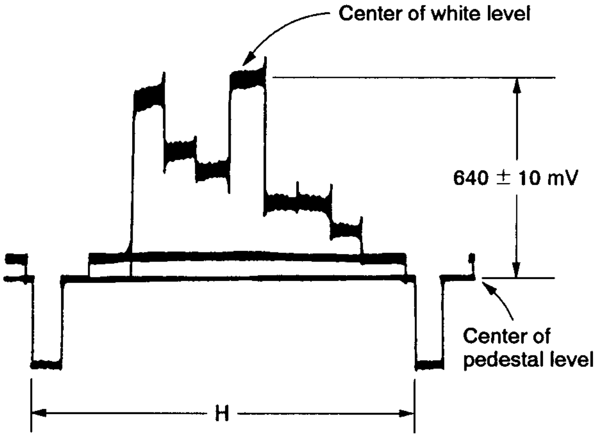


Fig. 7-23.

7-2-19. Max. Gain Adjustment (VC-117 Board)

Subject	Color bar chart standard picture frame
Filter	ND filters 1.0 (two), 0.4 (one), 0.1 (one)
Measurement Point	Pin Ⓐ8 (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	1C (MAX GAIN)
Specified Value	260 ± 10 mV

Adjusting method:

1) Cover the lens with the ND filter 2.5 (1.0+1.0+0.4+0.1).
2) Set the adjustment address to 1C with the adjustment remote controller.
3) Change the adjustment data with the adjustment remote controller to set the Y signal level to 260 ± 10 mV.
4) Change the adjustment address to store the adjustment data in the memory.

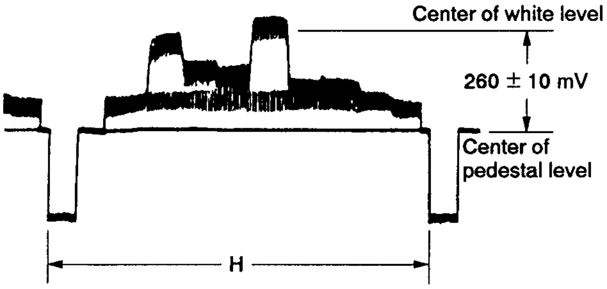


Fig. 7-24.

7-2-20. Aperture Adjustment (VC-117 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin Ⓐ8 (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	16 (APERTURE)
Specified Value	260 ± 10 mV

Adjusting method:

1) Set the adjustment address to 16 with the adjustment remote controller.
2) Focus the camera and set the aperture level (lower peak between green and white) to maximum.
3) Change the adjustment data to set the lower peak between green and white to 260 ± 10 mV above the pedestal level.
4) Change the adjustment address to store the adjustment data in the memory.

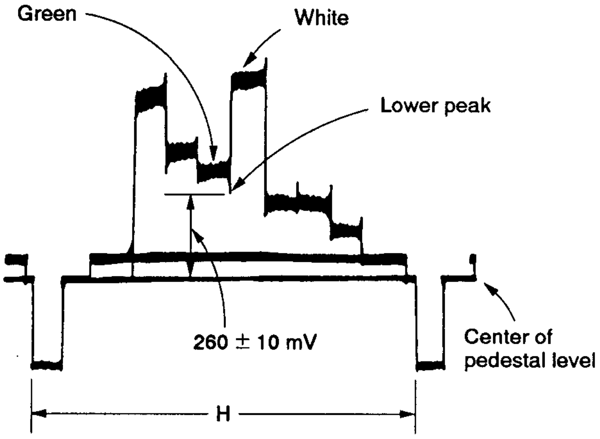


Fig. 7-25.

7-2-21. Chroma Level Adjustment (VC-117 Board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A1) (G OUT) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	09 (C LEVEL)
Specified Value	320 ± 20 mVp-p

Connections:

1) Connect Pin (B7) (OFFSET CONT) of the check point array to GND using a jumper wire.

Adjusting method:

1) Set the adjustment address to 09 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the G OUT signal level to 320 ± 20 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

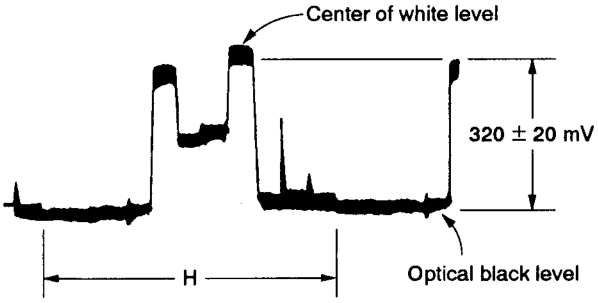


Fig. 7-26.

7-2-22. Burst Phase Adjustment (VC-117 Board) (Method Using Vectorscope)

Subject	All black (cover lens with black cap)
Measurement Point	VIDEO output terminal
Measuring Instrument	Vectrscope
Adjustment Address	11 (HUE CONT)
Specified Value	135° ± 2°

Adjustment method:

1) Set adjustment address to 11 with the adjustment remote controller.
2) Change adjustment data so as to set the burst luminance point in the 135° ± 2° position.
3) Change the adjustment address to store the adjustment data in the memory.
4) Perform Burst Level Adjustment.

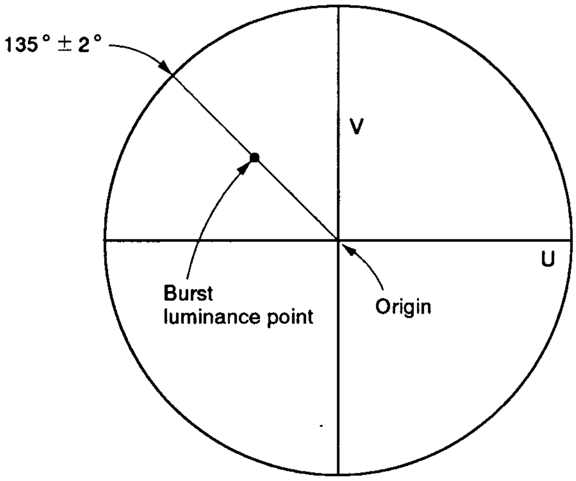


Fig. 7-27.

7-2-23. Burst Phase Adjustment (VC-117 Board) (Mothod Using Oscilloscope)

Subject	All black (cover lens with black cap)
Measurement Point	VIDEO output terminal
Measuring Instrument	Oscilloscope (Trigger slope:+)
Adjustment Address	11 (HUE CONT)
Specified Value	Burst phase should become a single line.

Adjusing method:

1) Set adjustment address to 11 with the adjustment remote controller.
2) Change the adjustment data so as to turn the burst waveform into a single line.
3) Change the adjustment address to store the adjustment data in the memory.
4) Perform Burst Level Adjustment.

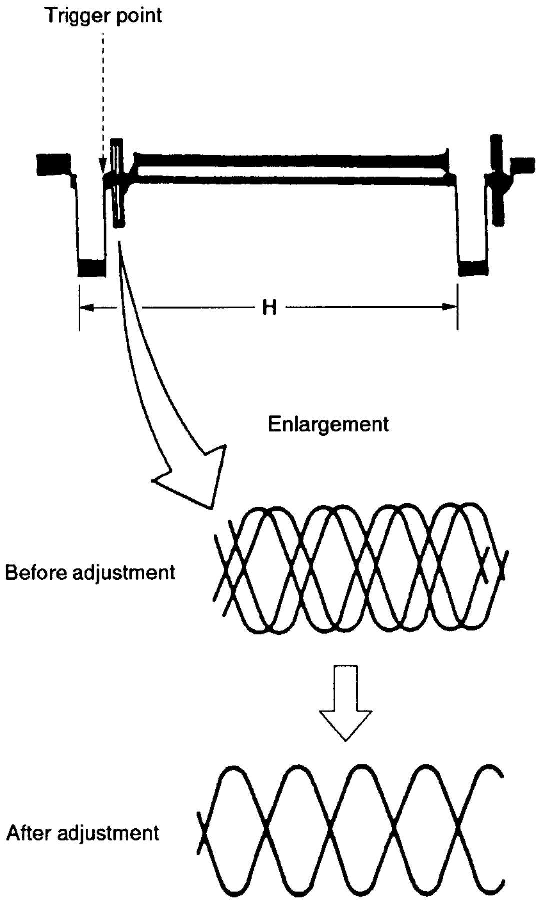


Fig. 7-28.

7-2-24. Burst Level Adjustment (VC-117 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A10) (CAM C) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	10 (BURST LEVEL)
Specified Value	300 ± 5 mVp-p

Adjusting method:

1) Set the adjustment address to 10 with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to set the burst level to 300 ± 5 mVp-p.
3) Change the adjustment address to store the adjustment data in the memory.

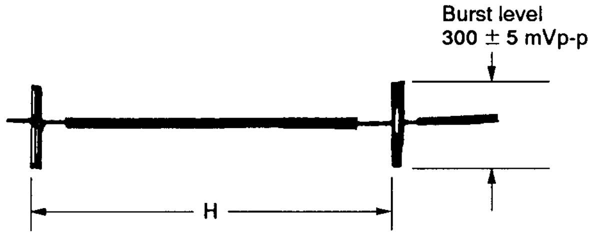


Fig. 7-29.

7-2-25. Indoor White Balance Adjustment (VC-117 Board) (Method Using Vectorscope)

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Address	0B (R GAIN) 0C (B GAIN)
Specified Value	The center of the white luminance point is within a circle with a diameter of 1 mm centered around the origin.

Adjusting method:

1) Set the adjustment address to 0B with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to match the white luminance point with the origin.
3) Set the adjustment address to 0C.
4) Change the adjustment data to match the white luminance point with the origin.
5) Repeat steps 1) through 4).
6) Change the adjustment address to store the adjustment data in the memory.
(The adjustment data should be 60 to FF)

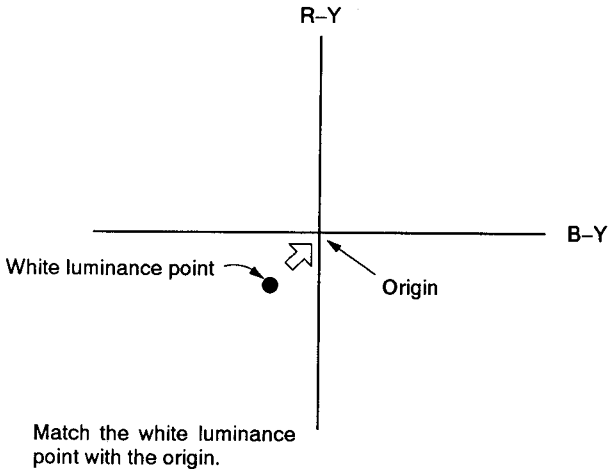


Fig. 7-30.

7-2-26. Indoor White Balance Adjustment (VC-117 Board) (Method Using Oscilloscope)

Subject	Color bar chart standard picture frame
Measurement Point	CH1 (X): emitter of Q257 (B–Y) CH2 (Y): emitter of Q255 (R–Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	0B (R GAIN) 0C (B GAIN)
Specified Value	Move the white luminance point to the black luminance point.

Adjusting method:

1) Set the adjustment address to 0B with the adjustment remote controller.
2) Change the adjustment data with the adjustment remote controller to match the white luminance point with the black luminance point.
3) Set the adjustment address to 0C.
4) Change the adjustment data to match the white luminance point with the black luminance point.
5) Repeat steps 1) through 4).
6) Change the adjustment address to store the adjustment data in the memory.
(The adjustment data should be 60 to FF)

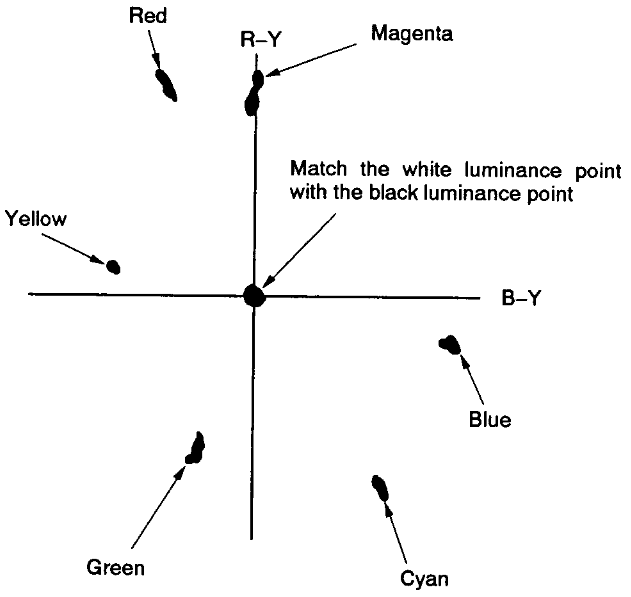

Red
R-Y
Magenta
Match the white luminance point with the black luminance point
Yellow
B-Y
Blue
Green
Cyan

Fig. 7-31.

7-2-27. Color Reproduction Adjustment (VC-117 Board) (Method Using Vectorscope)

Subject	Color bar chart standard picture frame
Measurement Point	Video output terminal
Measuring Instrument	Vectorscope
Adjustment Address	05 (R–Y GAIN) 06 (B–Y GAIN) 07 (R–Y HUE) 08 (B–Y HUE)
Specified Value	All color luminance points are within color reproduction frame.

Note: Confirm that "Burst Level Adjustment" and "Indoor White Balance Adjustment" have been completed.

Adjusting method:

1) Adjust the phase and gain of the vectorscope to set the burst luminance points to the designated position on the color reproduction frame.
2) Change the adjustment data at the various adjustment addresses using the adjustment remote controller until all color luminance points are within the color reproduction frame.
   (The adjustment data should be 40 to FF)
3) Change the adjustment address to store the adjustment data in the memory.

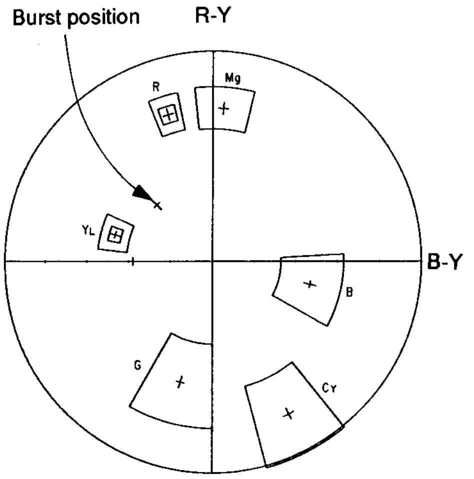


Fig. 7-32.

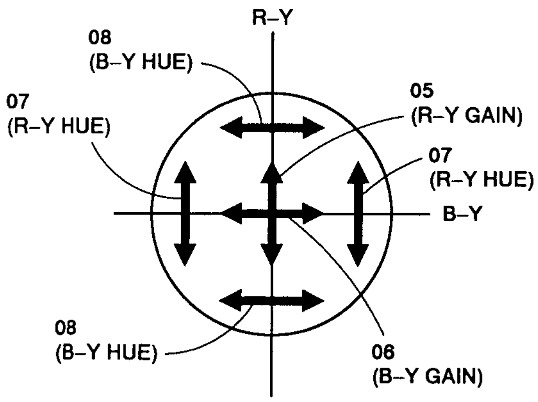


Fig. 7-33. Adjustment address and direction of luminance point movement

7-2-28. Color Reproduction Adjustment (Method Using Oscilloscope)

1. Gain adjustment (VC-117 board)

Subject	Color bar chart standard picture frame
Measurement Point	Pin (A10) (CAM C) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	05 (R–Y GAIN) 06 (B–Y GAIN)
Specified Value	Red level: 581 ± 32 mVp-p Yellow level: 382 ± 32 mVp-p

Note: Confirm that "Indoor White Balance Adjustment" is completed.

Adjusting method:

1) Set the adjustment address to 06 with the adjustment remote controller and set the adjustment data to B0.
2) Set the adjustment address to 07 and set the adjustment data to C0.
3) Set the adjustment address to 08 and set the adjustment data to C0.
4) Set the adjustment address to 05 and change the adjustment data to set the chroma signal "red" level to 581 ± 32 mVp-p.
5) Set the adjustment address to 06 and change the adjustment data to set the chroma signal "yellow" level to 382 ± 32 mVp-p.
   (The adjustment data should be 40 to FF)
6) Repeat steps 4) and 5).
7) Change the adjustment address to store the adjustment data in the memory.
8) Perform "Hue Adjustment".

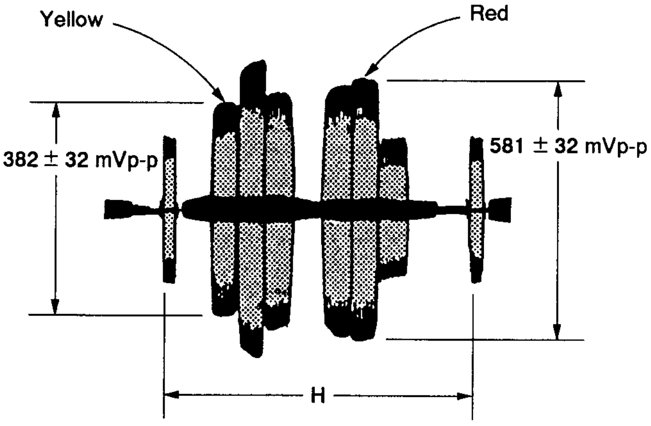


Fig. 7-34.

2. Hue adjustment (VC-117 board)

Subject	Color bar chart standard picture frame
Measurement Point	CH1 (X): emitter of Q257 (B–Y) CH2 (Y): emitter of Q255 (R–Y)
Measuring Instrument	Oscilloscope (X-Y mode)
Adjustment Address	07 (R–Y HUE) 08 (B–Y HUE)
Specified Value	Various color luminance points within color reproduction frame.

Note: Make sure that "Indoor White Balance Adjustment" is completed.

Adjusting method:

1) Match the "black" luminance point on the oscilloscope with the origin of the color reproduction frame.
2) Change the adjustment data at adjustment addresses 07 and 08 with the adjustment remote controller to bring the various color luminance points into the color reproduction frame.
3) Check the hue reproduced on the monitor TV and fine adjust the adjustment data at adjustment addresses 07 and 08 if necessary.
   (The adjustment data should be 40 to FF)
4) Set the oscilloscope to the normal mode and connect it to Pin (A10) of the check point array and confirm that the specified value of "1. Gain Adjustment" is satisfied. Change the data at the adjustment address 05 and 06 if the specified value is not met.
5) Change the adjustment address to store the adjustment data in the memory.

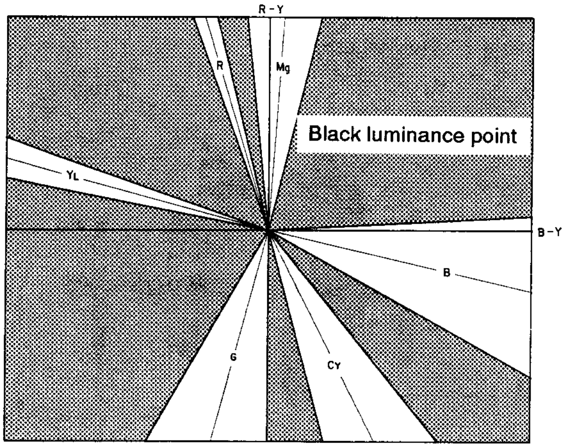


Fig. 7-35.

7-2-29. Auto White Balance Adjustment

Note: Be sure to first perform "Preset Adjustment" followed by "Auto White Balance Adjustment".

1. Preset adjustment (VC-117 board)

Subject	White pattern standard picture frame

Note: 1) Perform preset adjustment after supplying power to the unit for at least 30 seconds.
2) When performing preset adjustment again, once OFF/ON the power.

Preparations:

1) Prepare a 1 kΩ resistor for connecting Pin (B5) (AW ADJ) of the check point array and Pin ④ (CAM 5V) of W801.

Adjusting method:

1) Connect the Pin (B6) (CAM ADJ) of the check point array to the ground with a jumper wire after turning the power OFF and ON. Wait at least 30 seconds.
2) Select adjustment address 75 (AWB MODE) and set the adjustment data to E0.
3) Change the adjustment address to store the adjustment data in the memory.
4) Remove the jumper wire between Pin (B6) (CAM ADJ) of the check point array and the ground.
5) Connect Pin (B5) (AWB ADJ) of the check point array and Pin ④ of W801 (CAM 5V) with a 1 kΩ resistor.
6) Connect Pin (B6) (CAM ADJ) of the check point array to the ground using a jumper wire.
7) Confirm that the data indicated (address 01) on the adjustment remote controller is changed.
8) Remove the jumper wire connected to Pin (B6) (CAM ADJ) of the check point array after elapse of one second or more.
9) Remove the 1 kΩ resistor connected to Pin (B5) (AWB ADJ) of the check point array.
10) Connect Pin (B6) (CAM ADJ) of the check point array to the ground using a jumper wire.
11) Perform the following "Auto white balance adjustment".

2. Auto white balance adjustment (VC-117 board)

Note: Be sure to perform "Preset adjustment" before this adjustment.

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measuring Instrument	Oscilloscope (X-Y Mode)[Note 1]
Measurement Point	CH1 (X): emitter of Q257 (B–Y) CH2 (Y): emitter of Q255 (R–Y)
Adjustment Address	01 (DELTA R) 02 (DELTA B) 3F (START R) 40 (START B) 44 (TOP SLP B) 4B (TOP UP) 4C (TOP DWN) 54 (B UP LMT) 55 (IN BTOP) 56 (IN BMAX) 57 (OUT BMIN) 58 (OUT BDWN) 5A (R OUTDOOR) 5B (B OUTDOOR) 5C (Ra) 5D (Rb) 5E (Rc) 5F (Ba) 60 (Bb) 61 (Bc) 62 (R/B TOP) 63 (R/B MDL) 64 (R/B DWN) 65 (B/R TOP) 66 (B/R MDL) 67 (B/R DWN)
Specified Value	Line up the white luminance point with the black luminance point.

Note: 1) Adjustment can be made in the same manner using a vectorscope.
Connect to VIDEO OUT terminal when the vectorscope is used.
2) All calculations in this section are made in decimal.

Adjusting method:

- Outdoor preset adjustment

1) Select the adjustment address 75 (AWB MODE) with the adjustment remote controller and set the adjustment data to 10.
2) Cover the lens with C14 filter.
3) Change the adjustment data at the adjustment addresses 01 and 02 alternately with the adjustment remote controller to match the white luminance point with the black luminance point. (Match the white luminance point with the origin when using the vectorscope.)
The adjustment data of adjustment address 01 will be C_1 and the adjustment data of adjustment address 02 will be C_2.

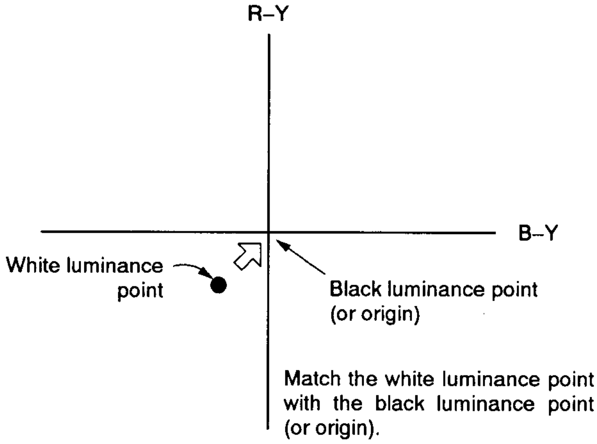

R–Y
B–Y
White luminance point
Black luminance point (or origin)
Match the white luminance point with the black luminance point (or origin).

Fig. 7-36.

- Adjustment data input with the tables

4) When C_2 value is from 3F through 55, obtain the adjustment data at the adjustment addresses 40, 54 to 58, 5B, 5F, 60 and 61 by Table 7-7., and enter the data into each address with the adjustment remote controller.
5) When C_1 value is from 25 through 30, obtain the adjustment data at the adjustment addresses 3F, 5A, 5C, 5D and 5E with Table 7-8., and enter the data into each address with the adjustment remote controller.
6) When C_1 value is from 25 through 30 and C_2 value is from 3F through 55, obtain the adjustment data of the adjustment addresses 44, 4B, 4C and 62 to 67 with Table 7-9., and enter the data into each address with the adjustment remote controller.
7) When the data input to all adjustment addresses with the Tables has completed in 4) through 6), perform the adjustments after 15). If there is the adjustment address in which the data input is impossible, perform the following "Adjustment data input by calculation".

- Adjustment data input by calculation

8) Convert the adjustment data C_1 to decimal to obtain C_1', and the adjustment data C_2 to decimal to obtain C_2'.
(See Table 7-5. Hexadecimal — decimal conversion table)

9) Obtain R' and B' by the following formula.
$R'=C_1'+2$
$B'=C_2'+4$

10) Convert R' to hexadecimal and enter it into the adjustment address 5A.

11) Convert B' to hexadecimal and enter it into the adjustment address 5B.

12) Obtain X' and Y' by the following formula.
$X'=64-R'$
$Y'=B'-48$

13) Obtain the adjustment data (decimal) by the following formula, convert to hexadecimal and enter the data into each adjustment address. (When converting, if there is a fraction under decimal, round it off.) Still, take down each adjustment data (decimal).
Address 54
$D_{54}'=Y'\times 2+48$
Address 55
$D_{55}'=B'$
Address 56
$D_{56}'=Y'\times 0.84+48$
Address 57
$D_{57}'=D_{56}'$
Address 58
$D_{58}'=Y'\times 0.3+48$
Address 5C
$D_{5C}'=64-X'\times 1.12$
Address 5D
$D_{5D}'=R'$
Address 5E
$D_{5E}'=64-X'\times 0.593$
Address 5F
$D_{5F}'=Y'\times 1.34+48$
Address 60
$D_{60}'=B'$
Address 61
$D_{61}'=Y'\times 0.467+48$

14) Obtain the adjustment data (decimal) by the following formula, convert to hexadecimal and enter the data into each adjustment address. (Round fractions off.)
Address 62
$D_{62}'=(D_{5D}'-D_{5C}')\times 64/(D_{5F}'-D_{60}')$
Address 63
$D_{63}'=(D_{5E}'-D_{5D}')\times 64/(D_{60}'-D_{61}')$
Address 64
$D_{64}'=(64-D_{5E}')\times 64/(D_{61}'-48)$
Address 65
$D_{65}'=(D_{5F}'-D_{60}')\times 16/(D_{5D}'-D_{5C}')$
Address 66
$D_{66}'=(D_{60}'-D_{61}')\times 16/(D_{5E}'-D_{5D}')$
Address 67
$D_{67}'=(D_{61}'-48)\times 16/(64-D_{5E}')$
Address 44
$D_{44}'=D_{62}'\times 1.8$
Address 4B
$D_{4B}'=D_{5C}'\times 2+16+(D_{5F}'\times D44')/64$
Address 4C
$D_{4C}'=D_{5C}'\times 2-14+(D_{5F}'\times D44')/64$
Address 3F
$D_{3F}'=D_{5E}'$
Address 40
$D_{40}'=D_{61}'$

- Auto white balance adjustment

15) Check the C14 filter is covered with the lens.

16) Select the adjustment address 75, and enter the adjustment data F0.

17) Change alternately the adjustment data at the adjustment addresses 01 and 02 with the adjustment remote controller to match the white luminance point with the black luminance point.
(Match the white luminance with the origin when using the vectorscope.)

18) Select the adjustment address 75, and enter the adjustment data 00.

19) Change the adjustment address to store the adjustment data in the memory.

(Example)

If C_2 is 49, the Ⓐ line is the required adjustment data.

C_2	Adjustment address										
	40	54	55	56	57	58	5B	5F	60	61	
3F	39	56	43	40	40	36	43	49	43	39	
40	39	58	44	41	41	36	44	4B	44	39	
41	3A	5A	45	42	42	36	45	4C	45	3A	
42	3A	5C	46	42	42	37	46	4D	46	3A	
43	3B	5E	47	43	43	37	47	4F	47	3B	
44	3B	60	48	44	44	37	48	50	48	3B	
45	3C	62	49	45	45	38	49	52	49	3C	
46	3C	64	4A	46	46	38	4A	53	4A	3C	
47	3D	66	4B	47	47	38	4B	54	4B	3D	
48	3D	68	4C	48	48	38	4C	56	4C	3D	
49	3E	6A	4D	48	48	39	4D	57	4D	3E	←Ⓐ
4A	3E	6C	4E	49	49	39	4E	58	4E	3E	
4B	3E	6E	4F	4A	4A	39	4F	5A	4F	3E	
4C	3F	70	50	4B	4B	3A	50	5B	50	3F	
4D	3F	72	51	4C	4C	3A	51	5C	51	3F	
4E	40	74	52	4D	4D	3A	52	5E	52	40	
4F	40	76	53	4D	4D	3B	53	5F	53	40	
50	41	78	54	4E	4E	3B	54	60	54	41	
51	41	7A	55	4F	4F	3B	55	62	55	41	
52	42	7C	56	50	50	3B	56	63	56	42	
53	42	7E	57	51	51	3C	57	64	57	42	
54	43	80	58	52	52	3C	58	66	58	43	
55	43	82	59	52	52	3C	59	67	59	43	

Table 7-7.

C_1	Adjustment address				
	3F	5A	5C	5D	5E
25	31	27	24	27	31
26	32	28	25	28	32
27	32	29	26	29	32
28	33	2A	27	2A	33
29	34	2B	28	2B	34
2A	34	2C	2A	2C	34
2B	35	2D	2B	2D	35
2C	35	2E	2C	2E	35
2D	36	2F	2D	2F	36
2E	37	30	2E	30	37
2F	37	31	2F	31	37
30	38	32	30	32	38

Table 7-8.

C_1	C_2	Adjustment address								
		44	4B	4C	62	63	64	65	66	67
25	3F	3A	9A	7C	20	40	6B	20	10	A
	40	31	92	74	1B	3A	6B	25	12	A
	41	31	93	75	1B	3A	60	25	12	B
	42	31	93	75	1B	35	60	25	13	B
	43	2B	8D	6F	18	35	57	2B	13	C
	44	2B	8E	70	18	31	57	2B	15	C
	45	26	89	6B	15	31	50	30	15	D
	46	26	8A	6C	15	2E	50	30	16	D
	47	26	8A	6C	15	2E	4A	30	16	E
	48	23	86	68	13	2B	4A	35	18	E
	49	23	87	69	13	2B	45	35	18	F
	4A	23	87	69	13	28	45	35	1A	F
	4B	1F	84	66	11	26	45	3B	1B	F
	4C	1F	85	67	11	26	40	3B	1B	10
	4D	1F	85	67	11	24	40	3B	1D	10
	4E	1D	82	64	10	24	3C	40	1D	11
	4F	1D	83	65	10	22	3C	40	1E	11
	50	1D	83	65	10	22	38	40	1E	12
	51	1B	81	63	F	20	38	45	20	12
	52	1B	81	63	F	20	35	45	20	13
	53	1B	81	63	F	1E	35	45	22	13
	54	19	7F	61	E	1E	33	4B	22	14
	55	19	80	62	E	1D	33	4B	23	14
26	3F	3A	9C	7E	20	40	64	20	10	A
	40	31	94	76	1B	3A	64	25	12	A
	41	31	95	77	1B	3A	5A	25	12	B
	42	31	95	77	1B	35	5A	25	13	B
	43	2B	8F	71	18	35	51	2B	13	D
	44	2B	90	72	18	31	51	2B	15	D
	45	26	8B	6D	15	31	4B	30	15	E
	46	26	8C	6E	15	2E	4B	30	16	E
	47	26	8C	6E	15	2E	45	30	16	F
	48	23	88	6A	13	2B	45	35	18	F
	49	23	89	6B	13	2B	40	35	18	10
	4A	23	89	6B	13	28	40	35	1A	10
	4B	1F	86	68	11	26	40	3B	1B	10
	4C	1F	87	69	11	26	3C	3B	1B	11
	4D	1F	87	69	11	24	3C	3B	1D	11
	4E	1D	84	66	10	24	38	40	1D	12
	4F	1D	85	67	10	22	38	40	1E	12
	50	1D	85	67	10	22	35	40	1E	13
	51	1B	83	65	F	20	35	45	20	13
	52	1B	83	65	F	20	32	45	20	15
	53	1B	83	65	F	1E	32	45	22	15
	54	19	81	63	E	1E	2F	4B	22	16
	55	19	82	64	E	1D	2F	4B	23	16
27	3F	3A	9E	80	20	3A	64	20	12	A
	40	31	96	78	1B	34	64	25	14	A
	41	31	97	79	1B	34	5A	25	14	B
	42	31	97	79	1B	30	5A	25	15	B
	43	2B	91	73	18	30	51	2B	15	D
	44	2B	92	74	18	2C	51	2B	17	D
	45	26	8D	6F	15	2C	4B	30	17	E
	46	26	8E	70	15	29	4B	30	19	E
	47	26	8E	70	15	29	45	30	19	F
	48	23	8A	6C	13	26	45	35	1B	F
	49	23	8B	6D	13	26	40	35	1B	10
	4A	23	8B	6D	13	24	40	35	1C	10
	4B	1F	88	6A	11	22	40	3B	1E	10
	4C	1F	89	6B	11	22	3C	3B	1E	11
	4D	1F	89	6B	11	20	3C	3B	20	11
	4E	1D	86	68	10	20	38	40	20	12
	4F	1D	87	69	10	1E	38	40	22	12
	50	1D	87	69	10	1E	35	40	22	13
	51	1B	85	67	F	1D	35	45	24	13
	52	1B	85	67	F	1D	32	45	24	15
	53	1B	85	67	F	1B	32	45	25	15
	54	19	83	65	E	1B	2F	4B	25	16
	55	19	84	66	E	1A	2F	4B	27	16

Table 7-9. (1)

C_1	C_2	Adjustment address								
		44	4B	4C	62	63	64	65	66	67
28	3F	3A	A0	82	20	3A	5C	20	12	B
	40	31	98	7A	1B	34	5C	25	14	B
	41	31	99	7B	1B	34	53	25	14	C
	42	31	99	7B	1B	30	53	25	15	C
	43	2B	93	75	18	30	4C	2B	15	E
	44	2B	94	76	18	2C	4C	2B	17	E
	45	26	8F	71	15	2C	45	30	17	F
	46	26	90	72	15	29	45	30	19	F
	47	26	90	72	15	29	40	30	19	10
	48	23	8C	6E	13	26	40	35	1B	10
	49	23	8D	6F	13	26	3B	35	1B	11
	4A	23	8D	6F	13	24	3B	35	1C	11
	4B	1F	8A	6C	11	22	3B	3B	1E	11
	4C	1F	8B	6D	11	22	37	3B	1E	12
	4D	1F	8B	6D	11	20	37	3B	20	12
	4E	1D	88	6A	10	20	34	40	20	14
	4F	1D	89	6B	10	1E	34	40	22	14
	50	1D	89	6B	10	1E	31	40	22	15
	51	1B	87	69	F	1D	31	45	24	15
	52	1B	87	69	F	1D	2E	45	24	16
	53	1B	87	69	F	1B	2E	45	25	16
	54	19	85	67	E	1B	2C	4B	25	17
	55	19	86	68	E	1A	2C	4B	27	17
29	3F	3A	A2	84	20	3A	55	20	12	C
	40	31	9A	7C	1B	34	55	25	14	C
	41	31	9B	7D	1B	34	4D	25	14	D
	42	31	9B	7D	1B	30	4D	25	15	D
	43	2B	95	77	18	30	46	2B	15	F
	44	2B	96	78	18	2C	46	2B	17	F
	45	26	91	73	15	2C	40	30	17	10
	46	26	92	74	15	29	40	30	19	10
	47	26	92	74	15	29	3B	30	19	11
	48	23	3E	70	13	26	3B	35	1B	11
	49	23	8F	71	13	26	37	35	1B	13
	4A	23	8F	71	13	24	37	35	1C	13
	4B	1F	8C	6E	11	22	37	3B	1E	13
	4C	1F	8D	6F	11	22	33	3B	1E	14
	4D	1F	8D	6F	11	20	33	3B	20	14
	4E	1D	8A	6C	10	20	30	40	20	15
	4F	1D	8B	6D	10	1E	30	40	22	15
	50	1D	8B	6D	10	1E	2D	40	22	17
	51	1B	89	6B	F	1D	2D	45	24	17
	52	1B	89	6B	F	1D	2B	45	24	18
	53	1B	89	6B	F	1B	2B	45	25	18
	54	19	87	69	E	1B	28	4B	25	19
	55	19	88	6A	E	1A	28	4B	27	19
2A	3F	26	90	72	15	33	55	30	14	C
	40	21	8B	6D	12	2F	55	38	16	C
	41	21	8B	6D	12	2F	4D	38	16	D
	42	21	8C	6E	12	2B	4D	38	18	D
	43	1D	87	69	10	2B	46	40	18	F
	44	1D	88	6A	10	27	46	40	1A	F
	45	1A	85	67	E	27	40	48	1A	10
	46	1A	85	67	E	25	40	48	1C	10
	47	1A	86	68	E	25	3B	48	1C	11
	48	17	83	65	D	22	3B	50	1E	11
	49	17	83	65	D	22	37	50	1E	13
	4A	17	84	66	D	20	37	50	20	13
	4B	15	81	63	C	1E	37	58	22	13
	4C	15	82	64	C	1E	33	58	22	14
	4D	15	82	64	C	1C	33	58	24	14
	4E	13	80	62	B	1C	30	60	24	15
	4F	13	80	62	B	1B	30	60	26	15
	50	13	81	63	B	1B	2D	60	26	17
	51	12	7F	61	A	1A	2D	68	28	17
	52	12	7F	61	A	1A	2B	68	28	18
	53	12	80	62	A	18	2B	68	2A	18
	54	10	7E	60	9	18	28	70	2A	19
	55	10	7E	60	9	17	28	70	2C	19
2B	3F	26	92	74	15	33	4E	30	14	D
	40	21	8D	6F	12	2F	4E	38	16	D
	41	21	8D	6F	12	2F	46	38	16	F
	42	21	8E	70	12	2B	46	38	18	F
	43	1D	89	6B	10	2B	40	40	18	10
	44	1D	8A	6C	10	27	40	40	1A	10
	45	1A	87	69	E	27	3B	48	1A	11
	46	1A	87	69	E	25	3B	48	1C	11
	47	1A	88	6A	E	25	36	48	1C	13
	48	17	85	67	D	22	36	50	1E	13
	49	17	85	67	D	22	32	50	1E	14
	4A	17	86	68	D	20	32	50	20	14
	4B	15	83	65	C	1E	32	58	22	14
	4C	15	84	66	C	1E	2F	58	22	16
	4D	15	84	66	C	1C	2F	58	24	16
	4E	13	82	64	B	1C	2C	60	24	17
	4F	13	83	64	B	1B	2C	60	26	17
	50	13	83	65	B	1B	29	60	26	19
	51	12	81	63	A	1A	29	68	28	19
	52	12	81	63	A	1A	27	68	28	1A
	53	12	82	64	A	18	27	68	2A	1A
	54	10	80	62	9	18	25	70	2A	1C
	55	10	80	62	9	17	25	70	2C	1C
2C	3F	26	94	76	15	2D	4E	30	17	D
	40	21	8F	71	12	29	4E	38	19	D
	41	21	8F	71	12	29	46	38	19	F
	42	21	90	72	12	25	46	38	1B	F
	43	1D	8B	6D	10	25	40	40	1B	10
	44	1D	8C	6E	10	22	40	40	1E	10
	45	1A	89	6B	E	22	3B	48	1E	11
	46	1A	89	6B	E	20	3B	48	20	11
	47	1A	8A	6C	E	20	36	48	20	13
	48	17	87	69	D	1E	36	50	22	13
	49	17	87	69	D	1E	32	50	22	14
	4A	17	88	6A	D	1C	32	50	25	14
	4B	15	85	67	C	1A	32	58	27	14
	4C	15	86	68	C	1A	2F	58	27	16
	4D	15	86	68	C	19	2F	58	29	16
	4E	13	84	66	B	19	2C	60	29	17
	4F	13	84	66	B	18	2C	60	2B	17
	50	13	85	67	B	18	29	60	2B	19
	51	12	83	65	A	16	29	68	2E	19
	52	12	83	65	A	16	27	68	2E	1A
	53	12	84	66	A	15	27	68	30	1A
	54	10	82	64	9	15	25	70	30	1C
	55	10	82	64	9	14	25	70	32	1C
2D	3F	26	96	78	15	2D	47	30	17	E
	40	21	91	73	12	29	47	38	19	E
	41	21	91	73	12	29	40	38	19	10
	42	21	92	74	12	25	40	38	1B	10
	43	1D	8D	6F	10	25	3A	40	1B	12
	44	1D	8E	70	10	22	3A	40	1E	12
	45	1A	8B	6D	E	22	35	48	1E	13
	46	1A	8B	6D	E	20	35	48	20	13
	47	1A	8C	6E	E	20	31	48	20	15
	48	17	89	6B	D	1E	31	50	22	15
	49	17	89	6B	D	1E	2E	50	22	16
	4A	17	8A	6C	D	1C	2E	50	25	16
	4B	15	87	69	C	1A	2E	58	27	16
	4C	15	88	6A	C	1A	2B	58	27	18
	4D	15	88	6A	C	19	2B	58	29	18
	4E	13	86	68	B	19	28	60	29	1A
	4F	13	86	68	B	18	28	60	2B	1A
	50	13	87	69	B	18	26	60	2B	1B
	51	12	85	67	A	16	26	68	2E	1B
	52	12	85	67	A	16	24	68	2E	1D
	53	12	86	68	A	15	24	68	30	1D
	54	10	84	66	9	15	22	70	30	1E
	55	10	84	66	9	14	22	70	32	1E
2E	3F	26	98	7A	15	2D	40	30	17	10
	40	21	93	75	12	29	40	38	19	10
	41	21	93	75	12	29	3A	38	19	12
	42	21	94	76	12	25	3A	38	1B	12
	43	1D	8F	71	10	25	34	40	1B	14
	44	1D	90	72	10	22	34	40	1E	14
	45	1A	8D	6F	E	22	30	48	1E	15
	46	1A	8D	6F	E	20	30	48	20	15
	47	1A	8E	70	E	20	2C	48	20	17
	48	17	8B	6D	D	1E	2C	50	22	17
	49	17	8B	6D	D	1E	29	50	22	19
	4A	17	8C	6E	D	1C	29	50	25	19
	4B	15	89	6B	C	1A	29	58	27	19
	4C	15	8A	6C	C	1A	26	58	27	1B
	4D	15	8A	6C	C	19	26	58	29	1B
	4E	13	88	6A	B	19	24	60	29	1C
	4F	13	88	6A	B	18	24	60	2B	1C
	50	13	89	6B	B	18	22	60	2B	1E
	51	12	87	69	A	16	22	68	2E	1E
	52	12	87	69	A	16	20	68	2E	20
	53	12	88	6A	A	15	20	68	30	20
	54	10	86	68	9	15	1E	70	30	22
	55	10	86	68	9	14	1E	70	32	22
2F	3F	26	9A	7C	15	26	40	30	1B	10
	40	21	95	77	12	23	40	38	1D	10
	41	21	95	77	12	23	3A	38	1D	12
	42	21	96	78	12	20	3A	38	20	12
	43	1D	91	73	10	20	34	40	20	14
	44	1D	92	74	10	1E	34	40	23	14
	45	1A	8F	71	E	1E	30	48	23	15
	46	1A	8F	71	E	1B	30	48	25	15
	47	1A	90	72	E	1B	2C	48	25	17
	48	17	8D	6F	D	1A	2C	50	28	17
	49	17	8D	6F	D	1A	29	50	28	19
	4A	17	8E	70	D	18	29	50	2B	19
	4B	15	8B	6D	C	17	29	58	2D	19
	4C	15	8C	6E	C	17	26	58	2D	1B
	4D	15	8C	6E	C	15	26	58	30	1B
	4E	13	8A	6C	B	15	24	60	30	1C
	4F	13	8A	6C	B	14	24	60	33	1C
	50	13	8B	6D	B	14	22	60	33	1E
	51	12	89	6B	A	13	22	68	35	1E
	52	12	89	6B	A	13	20	68	35	20
	53	12	8A	6C	A	12	20	68	38	20
	54	10	88	6A	9	12	1E	70	38	22
	55	10	88	6A	9	11	1E	70	3B	22
30	3F	26	9C	7E	15	26	39	30	1B	12
	40	21	97	79	12	23	39	38	1D	12
	41	21	97	79	12	23	33	38	1D	14
	42	21	98	7A	12	20	33	38	20	14
	43	1D	93	75	10	20	2F	40	20	16
	44	1D	94	76	10	1E	2F	40	23	16
	45	1A	91	73	E	1E	2B	48	23	18
	46	1A	91	73	E	1B	2B	48	25	18
	47	1A	92	74	E	1B	27	48	25	1A
	48	17	8F	71	D	1A	27	50	28	1A
	49	17	8F	71	D	1A	25	50	28	1C
	4A	17	90	72	D	18	25	50	2B	1C
	4B	15	8D	6F	C	17	25	58	2D	1C
	4C	15	8E	70	C	17	22	58	2D	1E
	4D	15	8E	70	C	15	22	58	30	1E
	4E	13	8C	6E	B	15	20	60	30	20
	4F	13	8C	6E	B	14	20	60	33	20
	50	13	8D	6F	B	14	1E	60	33	22
	51	12	8B	6D	A	13	1E	68	35	22
	52	12	8B	6D	A	13	1C	68	35	24
	53	12	8C	6E	A	12	1C	68	38	24
	54	10	8A	6C	9	12	1B	70	38	26
	55	10	8A	6C	9	11	1B	70	3B	26

Table 7-9. (2)

7-2-30. Outdoor White Balance Check (VC-117 Board)

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	When vectorscope used: video output terminal When oscilloscope used: CH1 (X): emitter of Q257 (B–Y) CH2 (Y): emitter of Q255 (R–Y)
Measuring Instrument	
Specified Value	See Fig. 7-37.

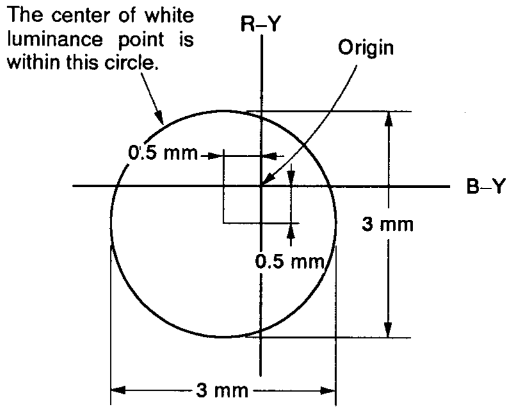
Connections:

1) Remove the jumper wire connected to Pin (B6) (CAM ADJ) of the check point array.
   (Set the EVR adjustment mode to OFF.)

Checking method:

1) Cover the lens with the C14 filter for color temperature correction.
2) Press the white balance button to select the outdoor white balance mode. (☀ mark is displayed on EVF screen.)
3) Confirm that the center of the white luminance point is within the standard circle.
   Note: When using a vectorscope, adjust the gain and phase of the vectorscope so that burst luminance point moves to the burst position of the color reproduction frame.

[When using vectorscope]


The center of white luminance point is within this circle.
R–Y
Origin
0.5 mm
B–Y
3 mm
0.5 mm
3 mm

[When using oscilloscope]

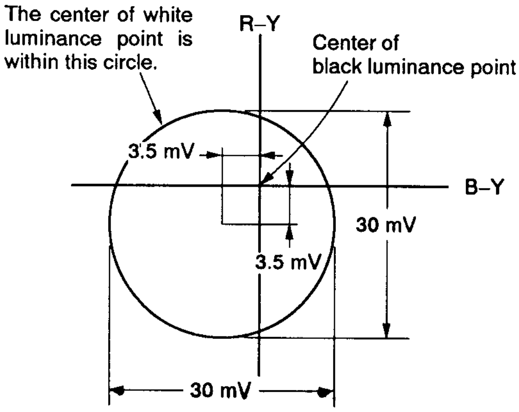

The center of white luminance point is within this circle.
R–Y
Center of black luminance point
3.5 mV
B–Y
30 mV
3.5 mV
30 mV

Fig. 7-37.

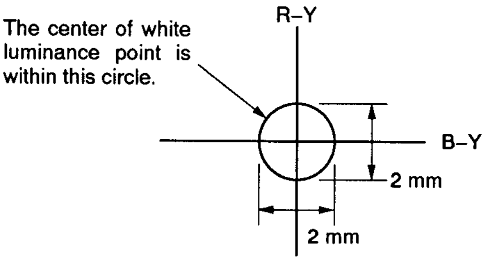
7-2-31. Auto White Balance Check (VC-117 Board)

Subject	White pattern standard picture frame
Filter	Filter C14 for color temperature correction
Measurement Point	When vectorscope used: video output terminal When oscilloscope used: CH1 (X): emitter of Q257 (B–Y) CH2 (Y): emitter of Q255 (R–Y)
Measuring Instrument	
Specified Value	See Fig. 7-38.

Checking method:

1) Select adjustment address 75 with the adjustment remote controller and enter adjustment data of F0. (Auto white balance tracking zone invalidity/all area discrimination mode setting)
2) Change the adjustment address to store the adjustment data in the memory.
3) Remove the jumper wire between Pin (B6) of the check point array and the ground.
   (Set the EVR adjustment mode to OFF.)
4) Set the white balance to the auto white balance mode.
5) Confirm that the white luminance point matches with the origin (or the black luminance point) when shooting the white pattern without the C14 filter.
6) Cover the lens with the C14 filter and confirm that the white luminance point matches with the origin (or the black luminance point) in about 2 seconds.
7) Connect Pin (B6) of the check point array to the ground with the jumper wire.
   (Set the EVR adjustment mode to ON.)
8) Select the adjustment address 75 with the adjustment remote controller and the adjustment data of 00.
   (Release auto white balance check mode)
9) Change the adjustment address to store the adjustment data in the memory.

[When using vectorscope]


R–Y
The center of white luminance point is within this circle.
B–Y
2 mm
2 mm

[When using oscilloscope]

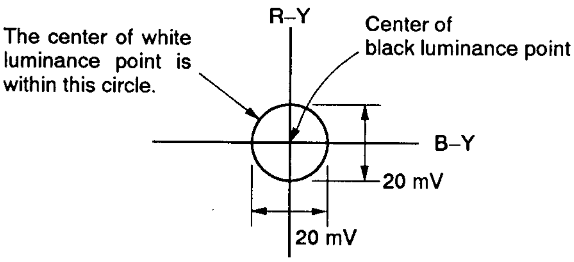

R–Y
Center of black luminance point
The center of white luminance point is within this circle.
B–Y
20 mV
20 mV

Fig. 7-38.

7-2-32. Focus Motor Speed Adjustment (VC-117 Board)

Subject	Arbitrary
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	24 (FOCUS SPEED)
Specified Value	Average value of data indicated on jig=6.0 ± 0.5

Remarks: The rotation time from the close extreme to far extreme of the focus ring should be approximately 2.5 seconds after completion of adjustment.

Adjusting method:

1) Set the auto focus to ON.
2) Select adjustment address 25 with the adjustment remote controller and enter adjustment data of 01.
   (Sets hunching mode)
3) Set the adjustment address to 24.
4) Change the adjustment data so that the indication on the AF microprocessor data reading jig is 06 while the ring is rotating.
5) Press the HOLD button of the AF microprocessor data reading jig while the focus ring is rotating to read the indication value.
6) Repeat step 5) ten times and obtain the average value.
   Specified value=6.0 ± 0.5
   Repeat steps 4) and 5) if the specified value is not satisfied.
7) Set the adjustment address to 25 and set the adjustment data to 00. (Releases hunching mode)
8) Change the adjustment address to store the adjustment data in the memory.

7-2-33. Macro Area Adjustment (VC-117 Board)

Subject	Arbitrary
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	27 (MACRO)
Specified Value	(Value at zoom ring WIDE position) −1

Adjusting method:

1) Press the WIDE side of the zoom button and set the zoom ring to the WIDE position (6.2 mm).
2) Select adjustment address 25 with the adjustment remote controller and set the adjustment data to 03. (Sets zoom position indication mode)
3) Read the data indicated on the AF microprocessor data reading jig. (Data in the range of 06 to 0E is displayed if normal.)
4) Change the adjustment address to 27.
5) Subtract 1 from the data read from the jig and enter as the adjustment data. (See Table 7-5. Hexadecimal — decimal conversion table)
6) Change the adjustment address to 25 and set the adjustment data to 00. (Releases zoom position indication mode)
7) Change the adjustment address to store the adjustment data in the memory.

7-2-34. Auto Focus Adjustment (VC-117 Board)

1. Adjustment in all black pattern

Subject	All black (cover lens with black cap)
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	33 (FHB), 35 (AGC B)

Adjusting method:

1) Set the auto focus to OFF with the focus button.
2) Select adjustment address 25 with the adjustment remote controller and set the adjustment data to FF.
   (Set the auto focus filter to FH)
3) Read the data indicated on the AF microprocessor data reading jig (FH B) and enter adjustment address 33. (FH B will be 00 to 04.)
4) Select adjustment address 25 and set the adjustment data to FD. (Set the auto focus filter to FA position.)
5) Confirm the data indicated the AF microprocessor data reading jig (FA B) is 00 to 0B.
6) Select adjustment address 25 and set the adjustment data to 0B. (Auto focus AGC adjustment mode)
7) Read the data indicated on the AF microprocessor data reading jig (AGC B) and enter adjustment address 35.
8) Perform "Adjustment in all white pattern".

2. Adjustment in all white pattern

Subject	All white pattern[Note]
Measurement Point	CN304
Measuring Instrument	AF microprocessor data reading jig
Adjustment Address	32 (FHW), 34 (AGC W)

Note: Place the pattern box without chart in the front of the camera. Set the zoom lever to TELE position and shoots the pattern box.

Adjusting method:

1) Select adjustment address 25 with the adjustment remote controller and enter adjustment data of FF.
2) Read the data (FH W) indicated on the AF microprocessor data reading jig and enter adjustment address 32. (FH W should be 00 or 01.)
3) Select adjustment address 25 and set the adjustment data to FD.
4) Confirm that the data (FA W) indicated on the AF microprocessor data reading jig is 00 to 03.
5) Select adjustment address 25 and set the adjustment data to 0B.
6) Read the data (AGC W) indicated on the AF microprocessor data reading jig and enter adjustment address 34.
7) Select adjustment address 25 and enter adjustment data of 00.
8) Change the adjustment address to store the adjustment data in the memory.

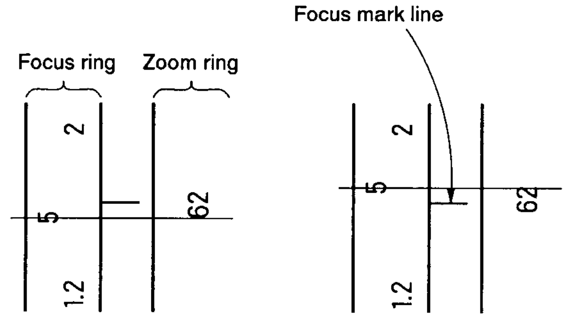
7-2-35. Auto Focus Check

Note: Perform adjustment with the EVF (electronic viewfinder) attached.

Subject	Siemens star (position 1.5 m from the front of the lens reference plane (CCD imager))

Measuring method:

1) Place the Siemens star 1.5 m from the front of the lens reference plane (See Fig. 7-2.).
2) Set the zoom lever to the TELE position (62 mm) and set the auto focus to ON with FOCUS button.
3) Adjust the position of the camera so that center of the Siemens star is lined up with the center of the monitor screen on the monitor TV screen.
4) To open the iris, decrease the illumination of the Siemens star chart to the range in which the normal image without the noise can be obtained.
   (Or cover lens with the ND filter.)
5) Set the auto-focus to OFF with FOCUS button.
6) Manually rotate the focus ring to set the focus. Confirm that the focus mark is inside the range shown in Fig. 7-39. at this time.
   Perform "Flange Back Adjustment" if the specification is not satisfied.
7) Turn the focus ring to the close extreme (1.2 m).
8) Set the auto-focus to ON with FOCUS button.
9) Confirm that there is focusing within two seconds and a sharp image can be obtained.
10) Set the auto-focus to OFF and turn the focus ring to the far extreme (∞).
11) Set the auto-focus to ON.
12) Confirm that there is focusing within three seconds and a sharp image can be obtained.



Specified value: The center of the character "5" of the focus ring is within the character "62" of the zoom ring.

Fig. 7-39.

7-2-36. Fader Level Adjustment

Subject	Arbitrary
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjusting Element	0F (FADER LEVEL)
Specified Value	20 ± 5 mV

Adjusting method:

1) Set adjustment data FF to adjustment address 03 (FADER) with the adjustment remote controller.
2) Change the adjustment address to 0F.
3) Change the adjustment data and set the FADER Y signal level to 20 ± 5 mV.
4) Change the adjustment address to 03 and set the adjustment data to 00.
5) Change the adjustment address to store the adjustment data in the memory.

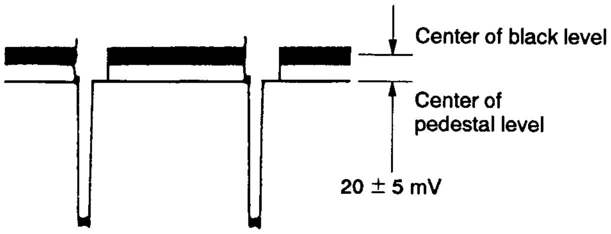


Fig. 7-40.

7-2-37. Power Zoom Speed Check

Subject	Arbitrary
Measuring Instrument	Stop watch
Adjustment Address	22 (ZOOM L SPD) 23 (ZOOM H SPD)
Specified Value	8.0 ± 2.0 sec.

Note: 1) In the adjustment mode, the zoom button of the remote commander does not function.

Checking method:

1) Confirm that the adjustment data of adjustment address 22 and 23 is 44.
2) Set the zoomring to the TELE-end position.
3) Press the WIDE side of the zoom button and measure how long it takes to rotate from TELE-end to WIDE-end.
4) Set the zoomring to the WIDE-end position.
5) Press the TELE side of the zoom button and measure how long it takes to rotate from WIDE-end to TELE-end.
6) If the specified value is not obtained in the step 2) or 3), change the adjustment address 22 and 23 with the adjustment remote controller and repeat steps 1) through 4). (Input the same value for adjustment address 22 and 23.)

Note: If the adjustment data is too small, the zoom motor will not rotate.

Adjustment data	Zoom speed
Large	Fast
↕	↕
Small	Slow

Table 7-10.

7-3. CAMERA REC SYSTEM ADJUSTMENTS

7-3-1. VCO Adjustment (VC-117 Board)

Subject	Arbitrary
Measurement Point	Pin ⑦ of IC141
Measuring Instrument	Digital voltmeter
Adjusting Element	CT141
Specified Value	2.8 ± 0.2 Vdc

Adjusting method:

1) Set to 2.8 ± 0.2 Vdc with CT141.

7-4. DIGITAL TITLER SYSTEM ADJUSTMENTS

7-4-1. Titler PLL Adjustment (TI-41P Board)

Subject	Arbitrary
Measurement Point	Connectiong point of RB801 and C808 (TP804)
Measuring Instrument	Digital voltmeter
Adjusting Element	CT801
Specified Value	2.42 ± 0.1 Vdc

Connection:

1) Connect TP801 (PLL ADJ: Pin (64) of IC803) of the check land and TP803 (VDD) with a jumper wire.

Adjusting method:

1) Adjust CT801 to 2.42 ± 0.1 Vdc.

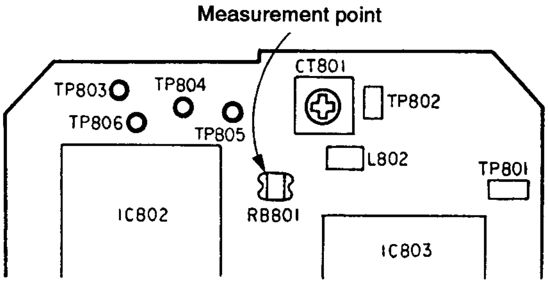


Fig. 7-41.

7-4-2. Character Generator fo Adjustment (TI-41P Board)

Subject	Arbitrary
Measurement Point	Pin ⑦ of IC802
Measuring Instrument	Frequency counter
Adjusting Element	CT802
Specified Value	6.38 ± 0.05 MHz

Connection:

1) Connect Pin ⑳ of IC802 (TP805) and TP803 (VDD) with a jumper wire.

Adjusting method:

1) Adjust CT802 to 6.38 ± 0.05 MHz.

7-4-3. Title A/D Level Adjustment

Subject	Color bar chart standard picture frame
Measurement Point	Confirmed on monitor TV
Measuring Instrument	
Adjustment Address	21 (TITLE TH)
Specified Value	See Fig. 7-42.

Note: Make sure that "Y Level Adjustment" is completed.

Adjusting method:

1) Select adjustment address 21 with the adjustment remote controller.
2) Press the MEMORY button (S772 on CF-24P board).
3) Confirm that blue and black portions are superimposed and become white, and confirm that red and magenta portions are not changed.
4) If this condition is not satisfied, change the adjustment data with the adjustment remote controller and repeat steps 2) and 3).
5) Change the adjustment address to store the adjustment data in the memory.

The shaded portion should be turned to white.

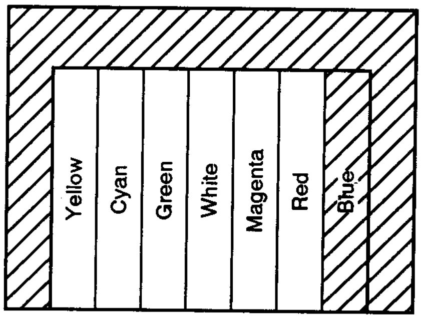


Fig. 7-43.

7-4-4. Title Y Level Adjustment (VC-117 Board)

Subject	All black (cover lens with black cap)
Measurement Point	Pin (A8) (CAM Y) of check point array
Measuring Instrument	Oscilloscope
Adjustment Address	0A (TITLE Y)
Specified Value	570 ± 80 mV

Note: Connect the EVF (electronic viewfinder) for adjustment.

Adjusting method:

1) Cover the lens with the black cap and press the MEMORY button (S772 on CF-24P board).
2) Confirm that "WHITE" characters are displayed in the EVF.
3) Select adjustment address 0A with the adjustment remote controller.
4) Change the adjustment data with the adjustment remote controller to set the Y signal level to 570 ± 80 mV.
5) Change the adjustment address to store the adjustment data in the memory.

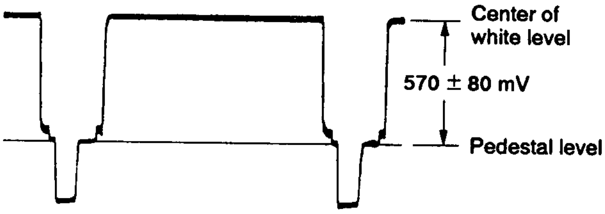


Fig. 7-43.

7-5. ELECTRONIC VIEWFINDER SYSTEM ADJUSTMENT (VF-41P BOARD)

7-5-1. Horizontal Tilt Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-45.

Adjustment method:

1) Adjust RV955 (BRIGHT) for appropriate brightness on CRT screen.
2) Loosen the DY (deflection yoke) tightening nut. (See Fig. 7-44.)
3) Make a picture horizontal by turning the DY.
4) Retighten the nut. (Do not tighten excessively.)

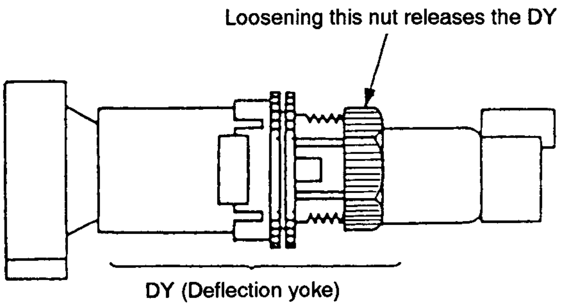
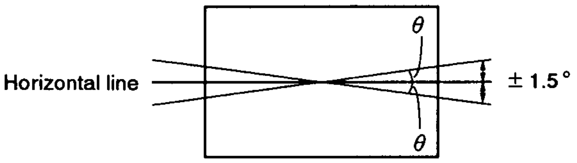


Fig. 7-44.



Specified value: Image orientation within ± 1.5 ° of horizontal line.

Fig. 7-45.

7-5-2. Centering Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Specified Value	See Fig. 7-47.

Adjustment method:

1) Turn the centering adjustment rings to provide an image with even right, left, upper and lower margins. (See Fig. 7-46.)

Note: Since the centering position is affected by the earth magnetism, turn the equipment over 360 ° horizontally, and make adjustments at the orientation which exhibits median displacements of the image.

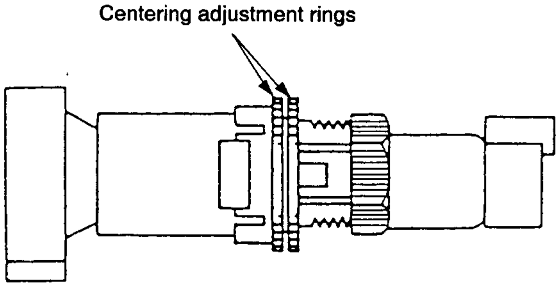


Fig. 7-46.

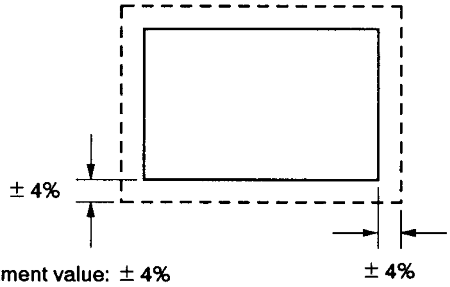


Fig. 7-47.

7-5-3. AFC Adjustment

Mode	E-E or Camera standby
Signal	Color bar
Measurement Point	C954 ⊕ side
Measuring Instrument	Digital voltmeter or oscilloscope (DC range)
Adjustment Element	RV951 (AFC)
Specified Value	2.6 ± 0.05 Vdc

Adjustment method:

1) Adjust RV951 (AFC) for 2.6 ± 0.05 Vdc.

7-5-4. Horizontal Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	C961
Specified Value	6 ± 2.5%

Adjustment method:

1) Line up the upper and lower sections of the monoscope image with the upper and lower edges of the screen by rotating RV952 (V SIZE).
2) Rotate RV955 (BRIGHT) to set the brightness to the normal level.
3) Short or open the pattern A of the H size adjustment capacitor (C961) to provide horizontal overscans of 6 ± 2.5% (total of left and right).
   (See Fig. 7-49.)

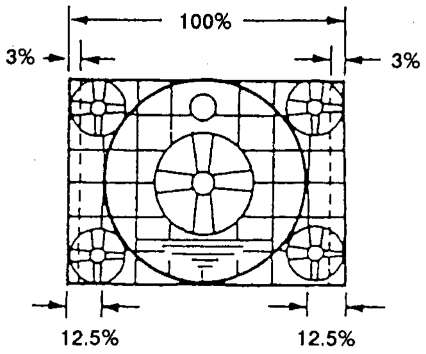
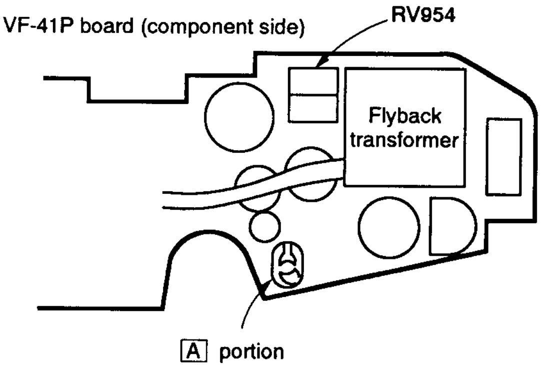


Fig. 7-48.



A section	H size
Open	Small
Short	Large

Fig. 7-49.

7-5-5. Vertical Amplitude Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV952 (V SIZE)
Specified Value	5 ± 2.5%

Adjustment method:

1) By turning RV952 (V SIZE), adjust vertical overscan to 5 ± 2.5% (upper and lower total).

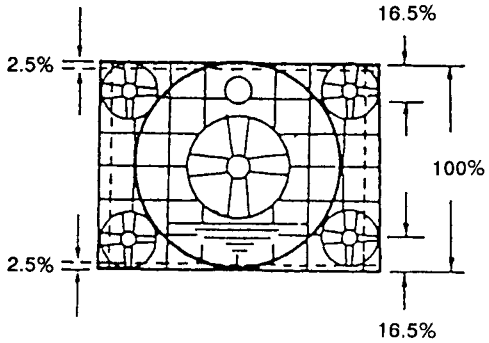


Fig. 7-50.

7-5-6. Focus Adjustment

Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	RV954

Adjustment method:

1) Adjust to the best focus point with RV954.

7-5-7. Brightness, Contrast Adjustments

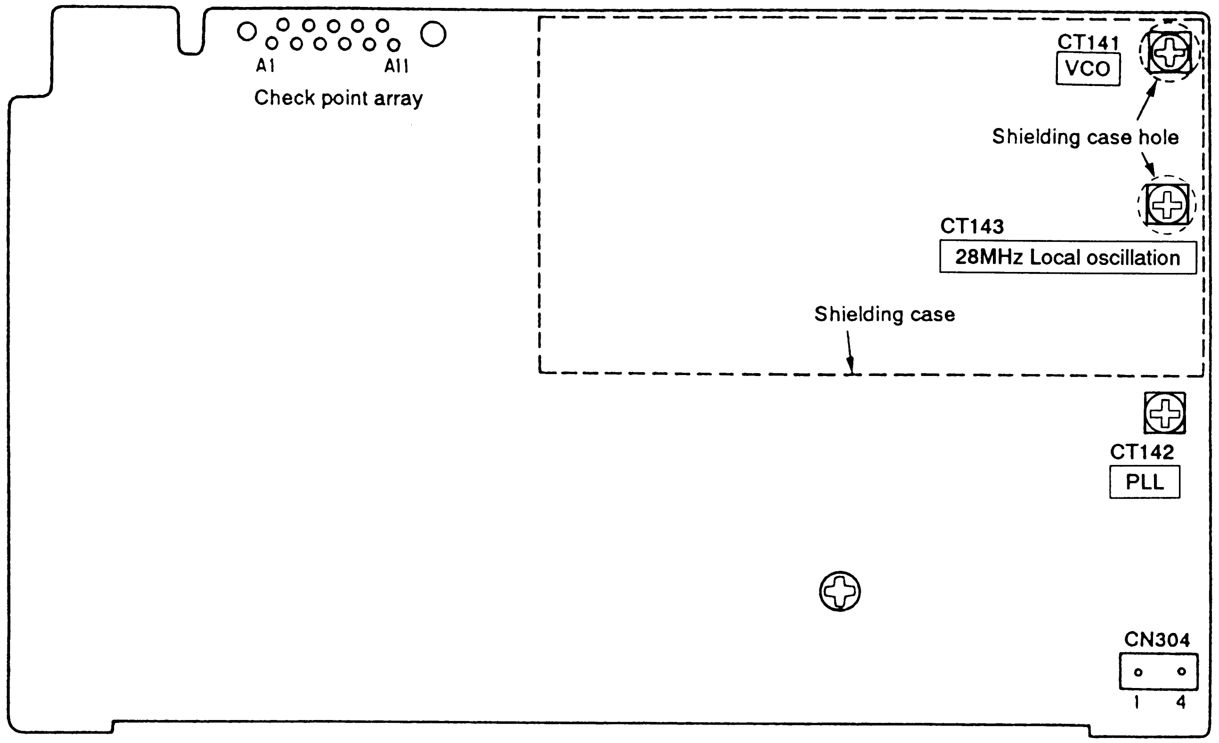
Mode	Playback
Signal	Alignment tape for checking operation (WR5-5CSP) Monoscope portion
Adjustment Element	Brightness: RV955 Contrast: RV953

Adjustment method:

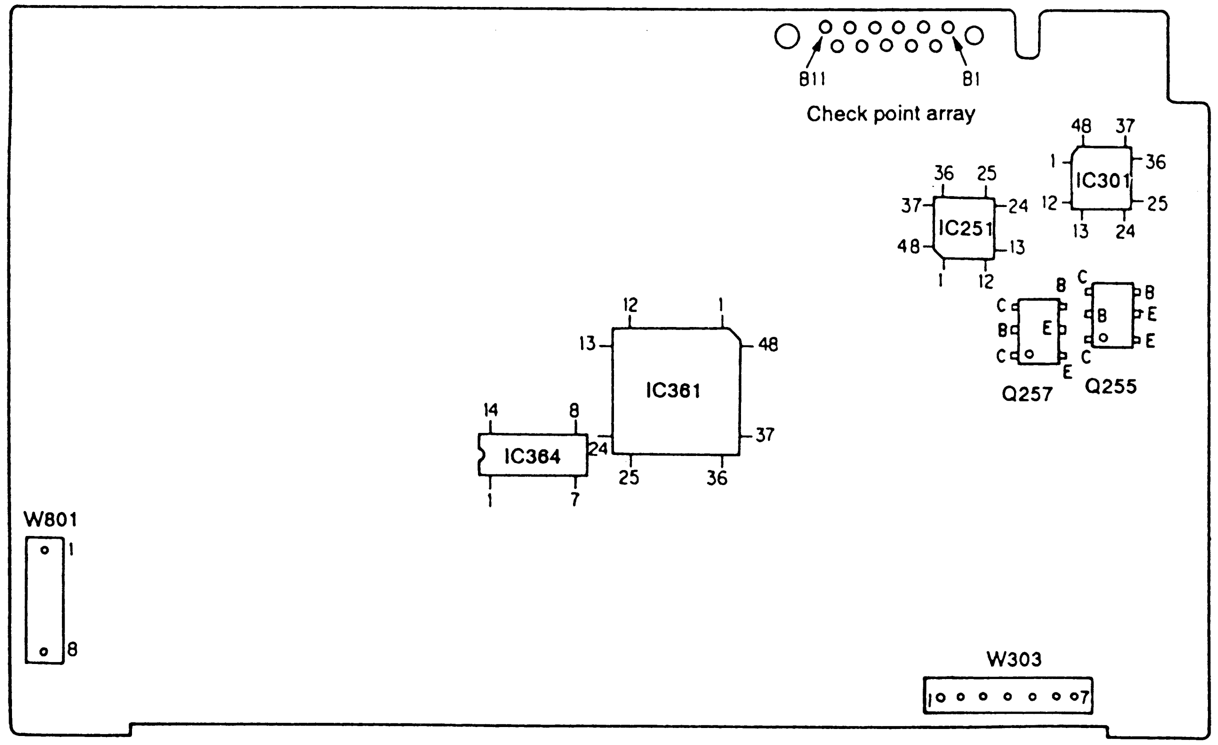
1) Adjust RV955 (BRIGHT) and RV953 (CONT) alternately until the bright and dark areas of a gray scale are displayed correctly. (The bright areas should not be made too bright to avoid a fuzzy display of the cross-hatches in the monoscope circle, and the brightness of the dark areas should be such that discrimination between the darkest and second darkest area is possible.)

7-6. ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

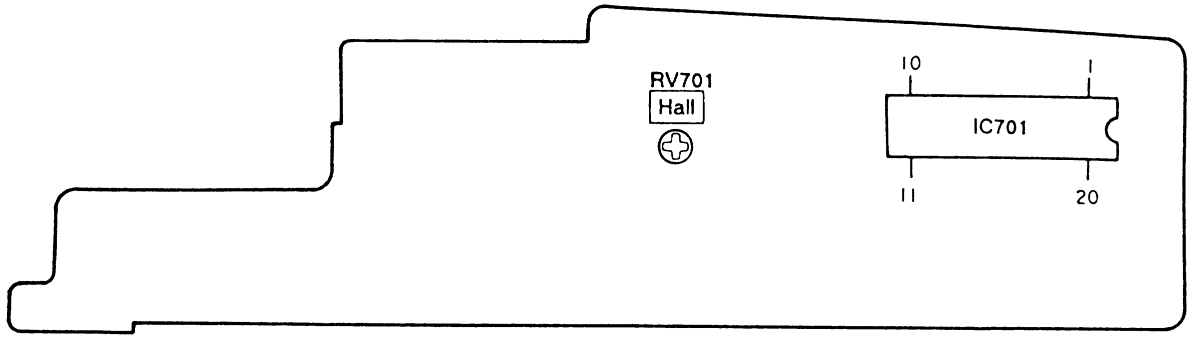
VC-117 BOARD (COMPONENT SIDE)
(Also illustrated on page 256.)


A1
A11
Check point array
CT141
VCO
Shielding case hole
CT143
28MHz Local oscillation
Shielding case
CT142
PLL
CN304
1
4

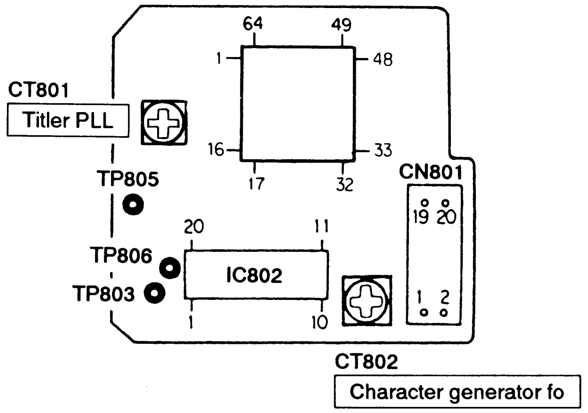
VC-117 BOARD (CONDUCTOR SIDE)
(Also illustrated on page 256.)


B11
B1
Check point array
48 37
1
36
IC301
12
25
13 24
36 25
37
24
IC251
48
13
1 12
B C
C
B E
C
E
Q257
B
E
B
E
C
Q255
12 1
13
48
IC361
37
25 36
14 8
IC364
24
1 7
W801
1
8
W303
1
7

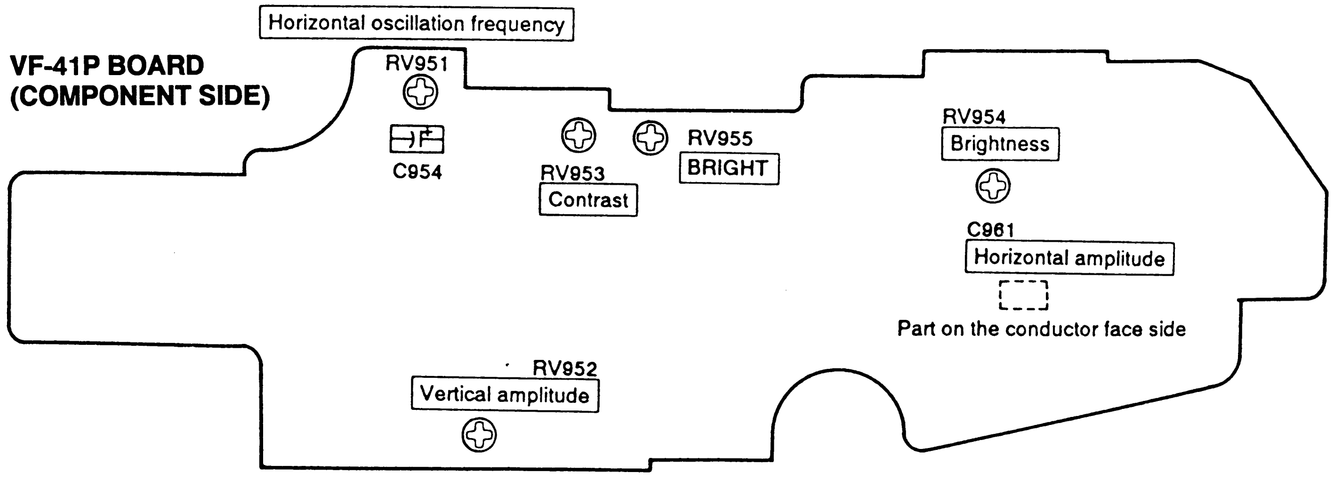
LD-54P BOARD (COMPONENT SIDE)


RV701
Hall
10
1
IC701
11
20

TI-41P BOARD (COMPONENT SIDE)


64 49
1
48
16
33
17 32
CT801
Titler PLL
TP805
CN801
19 20
1 2
20 11
TP806
IC802
TP803
1 10
CT802
Character generator fo

VF-41P BOARD
(COMPONENT SIDE)


Horizontal oscillation frequency
RV951
C954
RV953
Contrast
RV955
BRIGHT
RV954
Brightness
C961
Horizontal amplitude
Part on the conductor face side
RV952
Vertical amplitude

SECTION 8
MECHANISM BLOCK ADJUSTMENT

Refer to the separate "8 mm Video Mechanism Block Adjustment Guide III U mechanism for adjustment and checking of the mechanism block and for replacement of mechanical parts.

8-1. OPERATING WITH THE CASSETTE COMPARTMENT HOLDER ASSEMBLY REMOVED (See Fig. 8-1.)

Note: The unit will not function when a strong light source is near the unit.

1. Loading

1) Remove the outer and camera blocks referring to "section 2. DISASSEMBLY", and supply the power to the unit. (Set up the mechanism deck so as to operate.)
2) Set the power switch to "VTR" or "PLAYER" position.
3) Cover the LED assembly with ❶ opaque cap or the like.
4) Keep pressing the EJECT lever ❸ in the Ⓐ direction until the loading is completed.

2. Setting to the playback state

1) Perform the steps in "1. Loading".
2) Press the playback button.

3. Setting to the recording state

1) Perform the steps in "1. Loading".
2) Fix the RECOG switch ❷ with an adhesive tape.
3) Turn on the REC switch. (E, Australian model)
Connect Pins ③ and ⑬ of CN603 on the VS-91 board with a jumper wire until the enters the REC mode. (AEP, UK model)

4. Ejecting

1) Press the EJECT button.

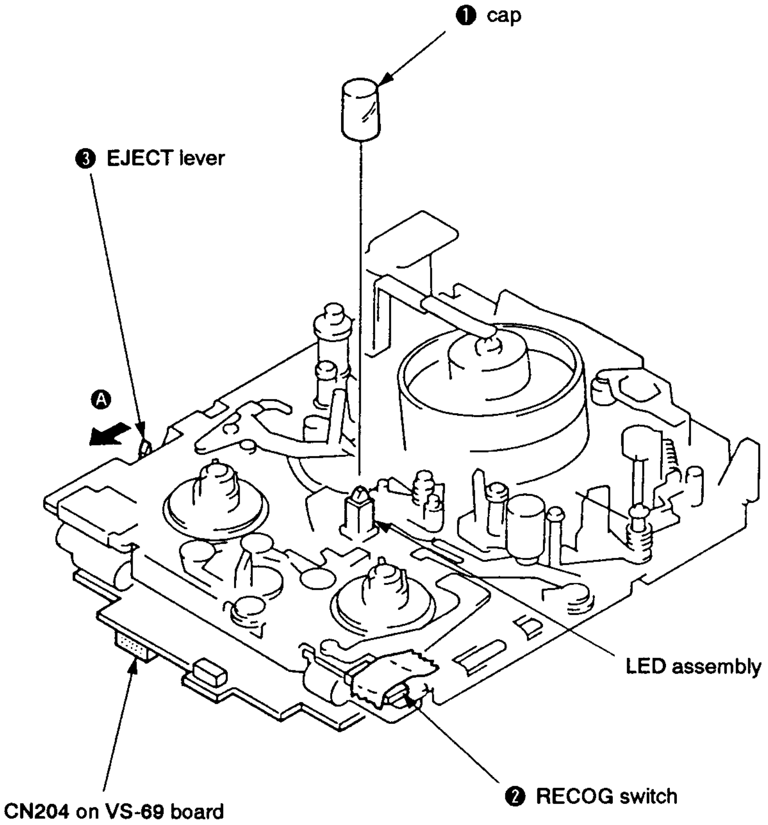


Fig. 8-1.

8-2. TAPE PATH ADJUSTMENT

1. Preparations

1) Clean the tape running surface (tape guide, drum, capstan shaft and pinch roller).
2) Short circuit Pins ③ and ⑦ of CN204 on the VS-91 board to set the PATH mode.
3) Connect to the oscilloscope.
   Channel 1...Pin ② of CN204 on VS-91 board
   External trigger...Pin ④ of CN204 on VS-91 board
4) Play back the tracking alignment tape (WR5-1CP or WR5-1C).
5) Confirm that the RF waveforms at both sides of the entrance and exit on the oscilloscope are flat.
   If not, perform the adjustment following "8 mm Video Mechanism Adjustment Guide III $\boxed{\text{U mechanism}}$ ".

CN204 on VS-91 board

1	PB RF CH1
2	PB RF CH2
3	PB RF GND
4	RF SWP
5	UN (1/2 RF SWP)
6	UN (REC C CHECK)
7	UN (PATH)
8	UN (TEST)
9	UN (CAM ADJ)
10	UN (SP)/LP
11	DRUM I COM
12	CAP FG

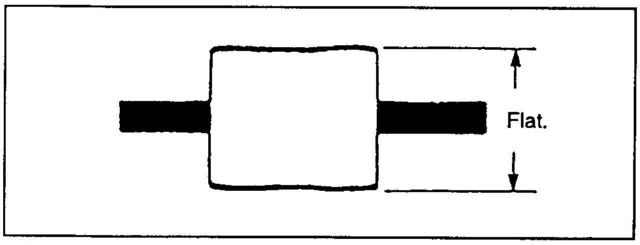


Fig. 8-2.

SECTION 9

VIDEO BLOCK ADJUSTMENTS

During the adjustments, see the arrangement diagram for adjustment parts from page 256.

9-1. PRE-ADJUSTMENT PREPARATIONS (VIDEO BLOCK)

Use the following measuring instruments for adjustment of the Video block.

9-1-1. Equipment to be Used

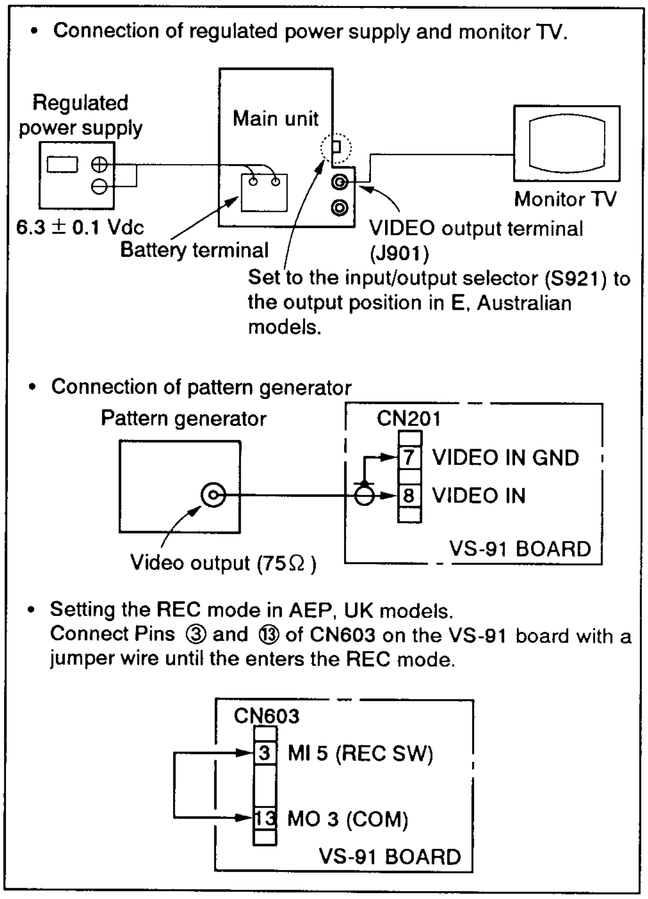
1) Monitor TV
2) Dual trace oscilloscope of over 10 MHz band, incorporates delay mode. (Use 10:1 probe unless otherwise specified.)
3) Frequency counter
4) Pattern generator with video output terminal
5) Digital voltmeter
6) Audio generator
7) Audio level meter
8) Audio distortion meter
9) Audio attenuator
10) Regulated power supply
11) Alignment tapes
    Tracking adjustment (WR5-1CP)*1
        Parts Code: 8-967-995-07
    Video frequency characteristics adjustment (WR5-6C)*2
        Parts Code: 8-967-995-17
    Operation check (WR5-4CL)*3
        Parts Code: 8-967-995-56
    Operation check (WR5-5CSP)*4
        Parts Code: 8-967-995-47

    Note:
    *1 WR5-1C (8-967-995-06) is also available.
    *2 WR5-2C (8-967-995-16) is also available.
    *3 WR5-3CL (8-967-995-36) is also available.
    *4 WR5-3CSP (8-967-995-27) and WR5-4CSP (8-967-995-46) are also available.
12) Adjustment remote controller (J-6082-053-A)

9-1-2. Connection of Equipment

Unless otherwise specified, adjustments are made with the measuring instrument connected as shown in Fig. 9-1.

- Camera/video power switch
  PLAYER position (AEP, UK model)
  VTR position (E, Australian model)
- Input/output selector switch ····OUTPUT position
  ※ E, Australian model only
- Connect the adjustment remote controller to the remote terminal (J941 on the SW-158P board) when performing "Battery Down Adjustment".


- Connection of regulated power supply and monitor TV.

Regulated power supply
Main unit
Monitor TV
6.3 ± 0.1 Vdc
Battery terminal
VIDEO output terminal (J901)

Set to the input/output selector (S921) to the output position in E, Australian models.

- Connection of pattern generator

Pattern generator
CN201
7
VIDEO IN GND
8
VIDEO IN
VS-91 BOARD
Video output (75Ω)

- Setting the REC mode in AEP, UK models.
  Connect Pins ③ and ⑬ of CN603 on the VS-91 board with a jumper wire until the enters the REC mode.

CN603
3
MI 5 (REC SW)
13
MO 3 (COM)
VS-91 BOARD

Fig. 9-1.

9-1-3. Note on Adjustments

The video block adjustment can be made without the camera block and the cabinet R except "Battery Down Adjustment" of system control adjustment. Remove the following four connectors in case of removing the camera block.

1. CN3 (8-pin) on DD-31P board
2. CN202 (7-pin) on VS-91 board
3. CN802 (16-pin) on VC-117 board
4. CN904 (3-pin) on FK-41P board.

The cabinet L is not required except for "Battery Down Adjustment". When removing the cabinet L, remove following connector.

1. CN911 (10-pin) on ZOOM SWITCH board.

The EVF (electronic viewfinder) block is not required for the video block adjustment. When removing the EVF block, remove the following connector.

1. CN205 (4-pin) on VS-91 board.

The microphone board (MA-135 board) is not required for the video block adjustment. When removing the microphone board, remove the following connector.

1. CN402 (3-pin) on AU-132 board.

Remove the following four boards from the MD frame, in case of adjusting the audio system or opening the VS-91 board.

1. FK-41P board
2. AU-132 board
3. DD-31P board (DC-DC converter)
4. VS-91 board

The zoom switch board is not required for the video block adjustments. When removing the zoom switch board, remove the following connector.

1. CN903 (11-pin) on FK-41P board.

9-1-4. Set-up for Adjustment

Since the video signal obtained from the pattern generator is used as the adjusting signal for the electrical adjustment, this video output signal should meet the required specifications. Connect an oscilloscope to Pin ⑧ (VIDEO IN) of CN201 on the VS-91 board and make sure that the amplitude of the video SYNC signal is approximately 0.3V, that the amplitude of the video image is approximately 0.7V, that the burst signal amplitude is approximately 0.3V with flat characteristics, and that the signal level ratio between the burst signal and "Red" signal is 0.30:0.66. The video signal (color bars) used for electrical adjustment are shown in Fig. 9-2.

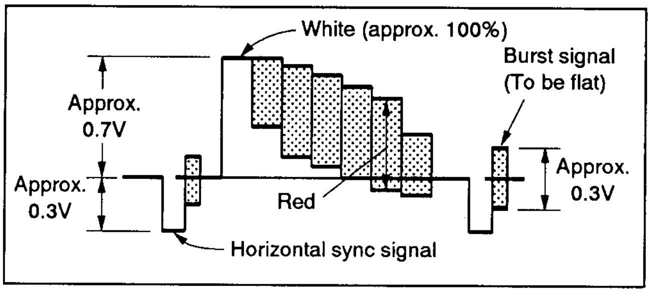


Fig. 9-2. Color bar signal of pattern generator

9-1-5. Alignment Tapes

The following alignment tapes are available.

Use the tape indicated in the signal column; however, in case there is no type indication in the signal column, use any tape for operation check.

Tape	REC mode	Type	Tape speed	Contents		Use
				Video area	PCM area	
Tracking WR5-1CP	L	MP	SP	CH2: 1 MHz tape path adjustment signal		Tape path adjustment
Video freq. characteristics WR5-6C	L	MP	SP	RF sweep: 0 to 10 MHz Marker: 1, 3.58, 5.5, 7MHz		Frequency characteristics adjustment
Operation check (SP mode) WR5-4CSP or WR5-5CSP	L	MP	SP	• Video signal Color bar: 4 min. Monoscope: 4 min. • Audio signal (AFM) 400 Hz, 60% modulation	• Audio signal (PCM) Monoscope: 20 Hz 20sec, 400 Hz 20sec, 14 kHz 20sec } Repeat four times. Color bar: 1 kHz 4 min.	Operation check
Operationn check (LP mode) WR5-4CL	L	MP	LP	• Video signal Color bar: 4 min. Monoscope: 4 min. • Audio signal (AFM) 400 Hz, 60% modulation		

Note: Recording mode

L ········ Conventional mode

E ········ Hi8 (high band) mode

Tape type

MP ········ Particle type metal tape

ME ········ Evaporated type metal tape

Table 9-1.

75% color bar signal recorded on an alignment tape is shown in Fig. 9-3.

Note: Measured at VIDEO output terminal.
(75Ω termination)

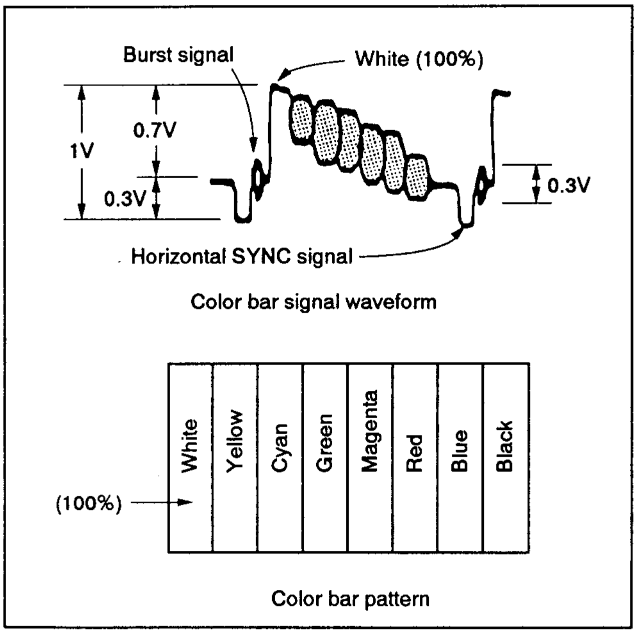


Fig. 9-3. Alignment tape color bar signal

9-1-6. I/O Level and Impedance

Video input*1 Pin jack
Input signal: 1 Vp-p, 75Ω unbalanced, negative sync

Video output Pin jack
Output signal: 1 Vp-p, 75Ω unbalanced, negative sync

Audio input*1 Pin jack
Input level: –7.5 dBs (0 dBs=0.775 Vrms)
Input impedance: More than 47 kΩ

Audio output Pin jack
Specified output: –7.5 dBs
Output impedance: 2.2 kΩ or less

*1 E, Australian models only.

9-1-7. Service Modes

This unit is equipped with service modes for adjustment and operation checking.

There are the following two service modes and switching between them is made by connection between GND and Pin (B6) of the check point array CPA001 on the VC-117 board.

Service Mode	Function	Connection between GND and Pin (B6) of the check point array
Status indication mode	For video block adjustment, operation checking	Open (no connection)
EVR adjustment mode	For adjustment of camera block	Shorted

Refer to "Camera Block Adjustment" for details on the EVR adjustment mode.

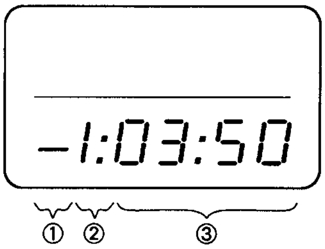
1. Invoking service mode

1) Connect the adjustment remote controller to the remote terminal (J941 on SW-158P board) of the main unit.
2) Set HOLD switch of the adjustment remote controller to the HOLD position (SERVICE position).

The status indication mode is invoked by the above operation. (To select the EVR adjustment mode, connect between Pin (B6) of the check point array CPA001 and GND with a jumper wire.)

2. Indication on adjustment remote controller LCD in the status indication mode

Note: In categories 1 through 5, the same information is displayed on the EVF screen.



①......Minus segment flashes to indicate that the service mode has been invoked.

②......Indicates service mode category.

③......Indicates battery voltage, LAST EMG, PRESET EMG, MODE SW CODE, or DEW MODE according to current category.

3. Category selection and indication in each category

Select the desired category with FF button of the adjustment remote controller. There are five categories (1 through 5) and the indications are different for each. (Note that the category 0 is the EVR adjustment mode.)

Caategory	Indication on LCD	
1	A/D conversion value for battery voltage (decimal indication)$^{\text{Note 1}}$ 00 : 00 – 02 : 55	
2	LAST EMG (last emergency)$^{\text{Note 2}}$ Refer to Service Mode Error Indications.	
3	PRESENT EMG (current emergency)$^{\text{Note 3}}$ Refer to Service Mode Error Indications.	
4	MODE SW CODE (mechanism status)	
	00 : 00	I.A
	00 : 01	I.C
	00 : 02	I.B
	00 : 03	STOP
	00 : 04	EJECT
	00 : 05	FWD (REC, PB, FF, REW, CUE, REVIEW, PAUSE)
	00 : 06	UNLOAD
	00 : 07	I.D
5	DEW MODE	
	00:00	NORMAL
	00:01	SENSOR ON DEW MODE (sensor in DEW mode)
	00:02	SENSOR OFF DEW MODE (Restart of operation is possible after the following conditions have been satisfied: 1. EJECT 2. More than 1H has elapsed.)

Note:
1) Indicates a value proportional to the battery voltage.
2) LAST EMG indicates the error occurred just before entering the service mode. Even if an error occurs in the service mode, it is not indicated.
3) PRESENT EMG indicates the status when FF button of the adjustment remote controller was pressed. So, the indication does not change even if the error is eliminated.

- **Service mode error indication**

Error Status	PRESENT EMG Indication	LAST EMG Indication
No error	00 : 00	00 : 00
Loading motor	00 : 01	00 : 01
REEL FG error during unthreading	00 : 02	00 : 02
REEL FG error not during unthreading	00 : 03	00 : 03
Capstan error	00 : 04	00 : 04
DRUM FG error (0) when starting drum	00 : 05	00 : 05
DRUM FG error (1) when starting drum	01 : 05	00 : 14
DRUM FG error (2) when starting drum	02 : 05	00 : 15
No DRUM PG (0) when starting drum	00 : 06	00 : 06
No DRUM PG (1) when starting drum	01 : 06	00 : 14
No DRUM PG (2) when starting drum	02 : 06	00 : 15
DRUM FG error (0) when drum stationary	00 : 07	00 : 07
DRUM FG error (1) when drum stationary	01 : 07	00 : 14
DRUM FG error (2) when drum stationary	02 : 07	00 : 15
No DRUM PG (0) when drum stationary	00 : 08	00 : 08
No DRUM PG (1) when drum stationary	01 : 08	00 : 14
No DRUM PG (2) when drum stationary	02 : 08	00 : 15
Phase error (0) when drum stationary	00 : 09	00 : 09

(1) During tape threading
(2) During tape unthreading
(0) Others

4. Releasing the service mode

The service mode can be released by returning HOLD switch of the adjustment remote controller to the NORMAL position or by disconnecting the adjustment remote controller from the remote terminal.

9-2. POWER SUPPLY BLOCK ADJUSTMENTS

9-2-1. Oscillation frequency adjustment (DD-31P Board)

Mode	Playback
Signal	Arbitrary tape
Measurement Point	Pin ⑦ of IC102
Measuring Instrument	Frequency counter
Adjusting Element	RV105
Specified Value	475 ± 5 kHz

Adjusting method:

1) Adjust RV105 for 475 ± 5 kHz.

9-2-2. VIDEO 5V adjustment (DD-31P Board)

Mode	Power ON
Measurement Point	Pin ② of CN102
Measuring Instrument	Digital voltmeter
Adjusting Element	RV103
Specified Value	4.92 ± 0.01 V

Adjusting method:

1) Adjust RV103 for 4.92 ± 0.01V.

9-2-3. Power Supply Check (VS-91 Board)

Mode	Power ON
Measuring Instrument	Digital voltmeter
VIDEO 5V	
Measurement Point	Pin ② of W605
Specified Value	4.92 ± 0.04V
REG 5V	
Measurement Point	Pin ③ of W605
Specified Value	4.91 ± 0.04V
EVF 5V	
Measurement Point	Pin ① of W605
Specified Value	4.96 ± 0.03V
MOTOR 5.1V	
Measurement Point	Pin ⑩ of CN602
Specified Value	$5.1^{+0.3V}_{-0.4V}$

Checking method:

1) Each power supply voltage should meet the corresponding specified value.

9-3. SYSTEM CONTROL ADJUSTMENTS

9-3-1. Battery Down Adjustment (DD-31P Board)

Mode	CAMERA recording
Signal	Arbitrary
Measurement Point	Check on LCD of adjustment remote controller
Measuring Instrument	
Adjusting Element	RV101
Specified Value	"–1:01:46"

Connections:

1) Connect a regulated power supply and digital voltmeter as shown in Fig. 9-4.
2) Connect Pins ⑧ (UN (TEST)) and ③ (PB RF GND) of CN204 on the VS-91 board with a jumper wire.
   (TEST mode)
3) Confirm that REC MODE switch is SP position.
   (Setting of SP mode)

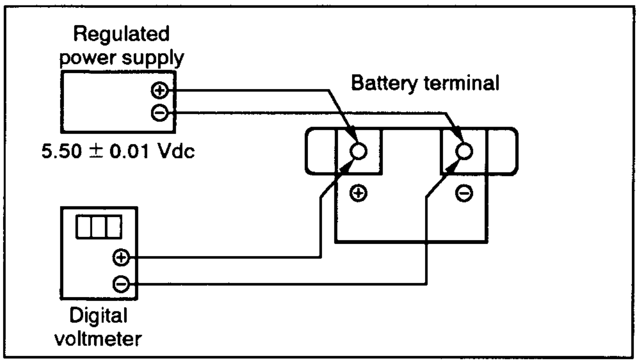
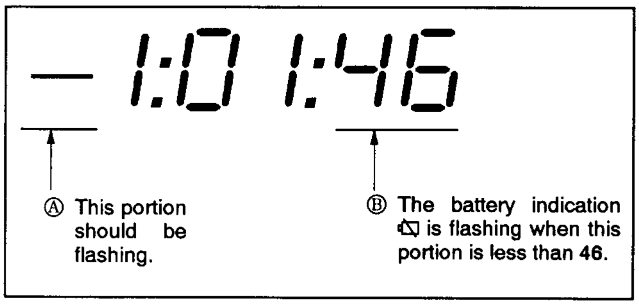


Fig. 9-4.

Adjusting method:

1) Connect the adjustment remote controller to the remote terminal (J941 on SW-158P board).
2) Set the power supply switch (S901) on the FK-41P board to CAMERA position to select the camera recording mode.
3) Set HOLD switch of the adjustment remote controller to the HOLD position (service position).
4) Confirm that the indication of the digital voltmeter is 5.50 ± 0.01 Vdc.
5) Set the LCD counter indication on the adjustment remote controller to "–1:01:46" using RV101 on the DD-31P board. (refer to Fig. 9-6.)



Ⓐ This portion should be flashing.

Ⓑ The battery indication 🔋 is flashing when this portion is less than 46.

Fig. 9-5.

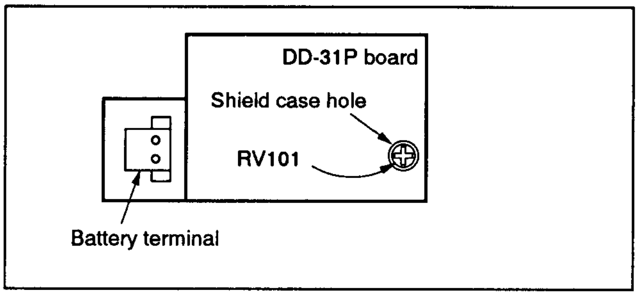


Fig. 9-6.

Checking method:

Remove connections 2) and 3) and check the following points. If the required conditions are not obtained, repeat the adjustments again.

1) Adjust the output voltage of the regulated power supply so that the digital voltmeter reading becomes 5.65 ± 0.01 Vdc. (VTR in camera recording mode)
2) Confirm that the 🔋 mark is not lit on the EVF (viewfinder) screen (TALLY lamp is lit).
3) Lower the output voltage of the regulated power supply so that the digital voltmeter reading becomes 5.53 ± 0.01 Vdc.
4) Confirm that the 🔋 mark and the TALLY lamp are flashing in approx. 1 sec intervals on the EVF screen.
5) Lower the output voltage of the regulated power supply so that the digital voltmeter reading becomes 5.56 ± 0.01 Vdc.
6) Confirm that the flashing interval of the 🔋 mark and the TALLY lamp on the EVF screen becomes shorter, and that the VTR stops and the power is turned off.

9-3-2. System Clock Adjustment (VC-117 Board)

Note: Perform the adjustment without the lens.

Mode	Power ON
Measurement Point	Pin (59) of IC561
Measuring Instrument	Frequency counter
Adjusting Element	RV561
Specified Value	330 ± 5 kHz

Adjusting method:

1) Adjust RV561 for 330 ± 5 kHz.

9-4. SERVO SYSTEM ADJUSTMENTS

9-4-1. Capstan FG Frequency Check (VS-91 Board)

Mode	Recording (SP/LP)
Signal	Arbitrary
Measurement Point	Pin ⑫ (CAP FG) of CN204
Measuring Instrument	Frequency counter
Specified Value	SP mode: 1327 ± 2 Hz LP mode: 663.5 ± 2 Hz

Checking method:

1) Connect Pin ⑩ of CN204 to ground with a jumper wire or set REC MODE switch to the LP position. (Setting of LP mode)
2) Set to the recording mode and confirm that the capstan FG frequency is 663.5 ± 2 Hz.
3) Set to the stop mode and remove the jumper wire between Pin ⑩ of CN204 and GND or set REC MODE switch to the SP position. (Setting of SP mode)
4) Set to the recording mode and confirm that the capstan FG frequency is 1327 ± 2 Hz.

9-4-2. Capstan FG Offset Adjustment (VS-91 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	Pin ⑫ (CAP FG) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV502
Specified Value	50 ± 1% duty cycle

Adjusting method:

1) Adjust RV502 so that the CAP FG output waveform duty cycle becomes 50 ± 1%.

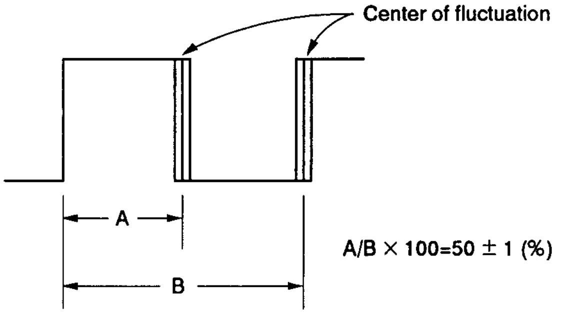


Fig. 9-7. Capstan FG offset adjustment

9-4-3. Drum Phase Lock Check (VS-91 Board)

Mode	Recording (SP)
Signal	Arbitrary
Measurement Point	CH-1: Pin ⑪ (SYSTEM SYNC) of IC601 CH-2: Pin ④ (RF SWP) of CN204
Measuring Instrument	Oscilloscope
Specified Value	224 ± 50 μsec

Checking method:

1) Confirm that duration between the switching point of CH-2 (RF SWP) and the rising edge of CH-1 (SYSTEM SYNC) is 224 ± 50 μsec.

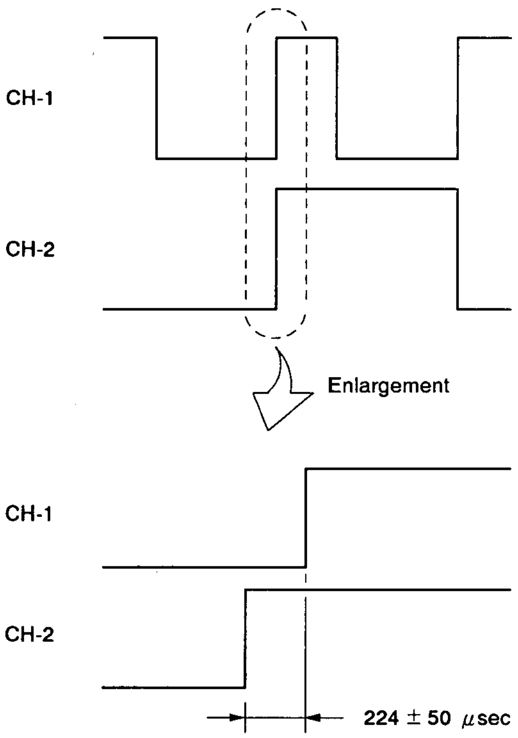


Fig. 9-8. Drum phase lock check

9-4-4. Switching Position Adjustment (VS-91 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	CH-1: Video output terminal CH-2: Pin ④ (RF SWP) of CN204
Measuring Instrument	Oscilloscope
Adjusting Element	RV602
Specified Value	6.5 ± 0.3H (410 ± 20 μsec)

Connection:

1) Connect Pin ⑧ (UN (TEST)) of CN204 to ground with a jumper wire. (TEST mode)
2) Confirm that REC MODE switch (S770 on CF-25P board) is SP position. (Setting of SP mode)

Adjusting method:

1) Adjust RV602 for 6.5 ± 0.3H (410 ± 20 μsec).

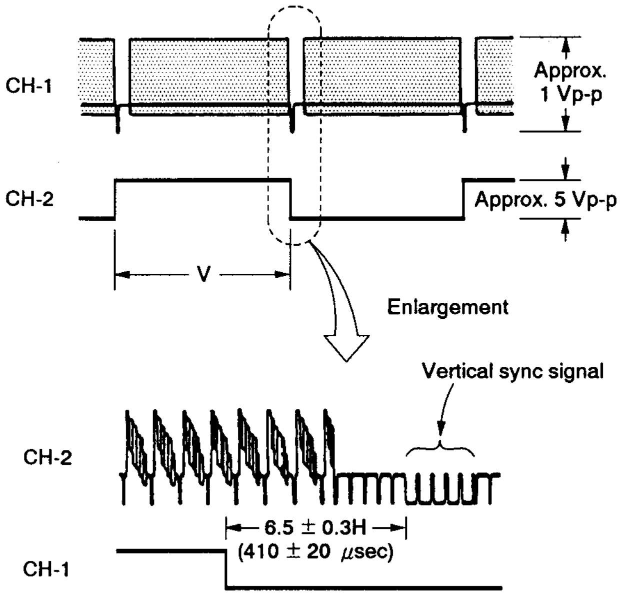


Fig. 9-9. Switching position adjustment

9-5. VIDEO BLOCK ADJUSTMENTS

The adjustment of the video system should in principle follow the adjustment procedure outlined below.

The color video signal supplied from the pattern generator is utilized as the video input signal for the video system adjustment in the recording mode. Make sure that the sync signal and the color burst signal match the specifications given in Set-up for adjustment, as shown in Fig. 9-2.

[Adjustment procedure]

1) Playback frequency characteristics adjustment
2) Flying erase check
3) Crystal oscillator fo adjustment
4) Y/C Separation adjustment
5) IR2 adjustment
6) SYNC AGC adjustment
7) Emphasis input level adjustment
8) PB Y level 1 adjustment
9) PB Y level 2 adjustment
10) Y FM carrier frequency adjustment
11) Y FM deviation adjustment
12) Chroma emphasis fo adjustment
13) REC C RF level adjustment
14) REC Y level adjustment
15) REC ATF level checking
16) Feedback chroma adjustment
17) Quasi burst phase adjustment
18) Delay burst phase adjustment

9-5-1. Playback Frequency Characteristics Adjustment (VS-91 Board)

Note: The adjusting element for CH2 is shown in parentheses [ ].

Mode	Playback
Signal	Alignment tape: For frequency characteristics adjustment (WR5-6C)
Measurement Point	CH1: Pin ① [Pin ②] of CN204 EXT TRIG: Pin ④ of CN204
Measuring Instrument	Oscilloscope TRIG SLOPE: +, [–]
Adjusting Element	RV113 [RV112]
Specified Value	3.58 MHz level : 5.5 MHz level =4 : (2.9 ± 0.3)

Adjusting method:

1) Adjust RV113 [RV112] so that the ratio of the 3.58 MHz level to the 5.5 MHz level of the PB RF output waveform becomes 4: (2.9 ± 0.3) .

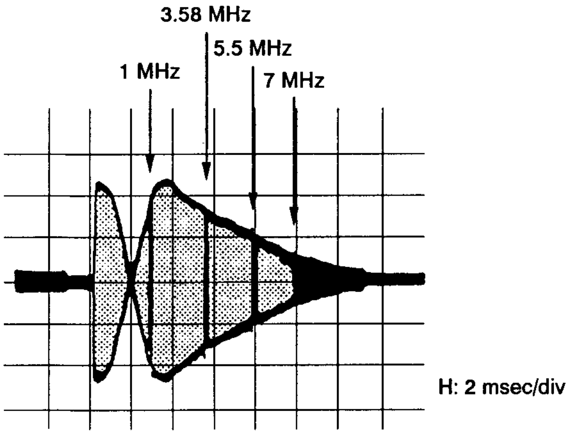


Fig. 9-10. Playback frequency characteristics adjustment

9-5-2. Flying Erase Check (VS-91 Board)

Mode	Recording
Signal	Arbitrary
Measurement Point	Pin ⑮ of CN101 (FE (X))
Measuring Instrument	Oscilloscope and frequency counter
Specified Value	Frequency: Over 7.0 MHz Voltage: Over 6.0 Vp-p

Note: Be sure to use MP type tape.
(Pin ⑫ of CN602 should be "L".)

Checking method:

1) Confirm that the oscillation frequency is over 7.0 MHz and that the oscillation voltage is over 6.0 Vp-p.

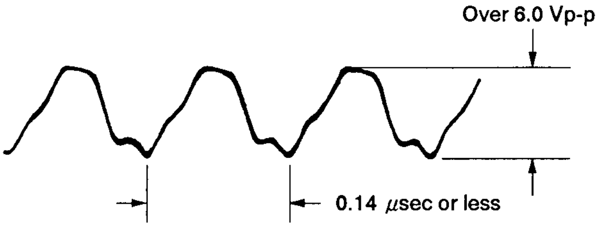


Fig. 9-11. Flying erase check

9-5-3. Crystal Oscillator fo Checking (VS-91 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	Pin ⑯ of IC203
Measuring Instrument	Frequency counter
Specified Value	4433618 ± 100 Hz

Note: Connect the frequency counter through a buffer of high impedance (approx. 10 MΩ) and low capacitance (10 pF or less).

Checking method:

1) Confirm that the oscillation frequency at Pin ⑯ of IC203 is 4433618 ± 100 Hz.

9-5-4. Y/C Separation Adjustment (VS-91 Board)

Mode	Recording
Signal	Color bars
Measurement Point	Any terminal of RV203 (DEV) (Pin ㉕ of IC203)
Measuring Instrument	Oscilloscope
Adjustment Element	RV207
Specified Value	Minimum residual chroma component

Connections:

1) Connect Pin ㊴ of IC203 (Pin ⑭ of IC202) to GND with a 10 µF/16V electrolytic capacitor.
(Capacitor negative side to GND)

Adjustment method:

1) Set the residual chroma component to minimum with RV207.

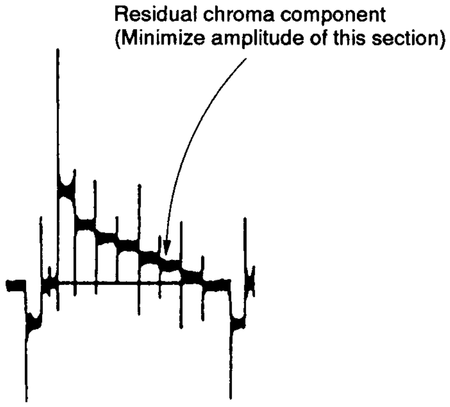


Fig. 9-14. Y/C separation adjustment

9-5-5. IR2 Adjustment (VS-91 Board)

Mode	Recording
Signal	Color bars
Measurement Point	Pin ⑧ of IC203 or base of Q229 (BF OUT)
Measuring Instrument	Oscilloscope
Adjustment Element	RV206
Specified Value	7.0 ± 0.2 µsec

Adjustment method:

1) Adjust RV206 so that it becomes 7.0 ± 0.2 µsec.

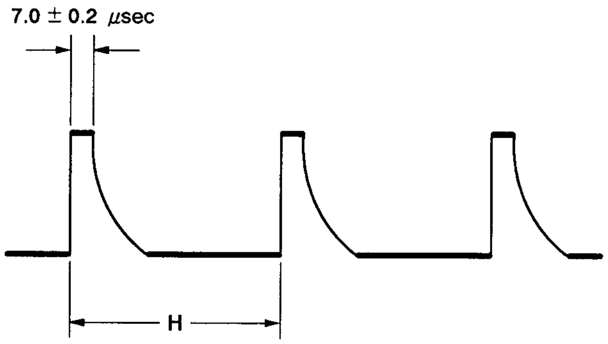


Fig. 9-15. IR2 adjustment

9-5-6. SYNC AGC Adjustment (VS-91 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin ㊾ of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	RV201
Specified Value	0.49 ± 0.025 Vp-p

Adjustment method:

1) Adjust with RV201 so that it becomes 0.49 ± 0.025 Vp-p.

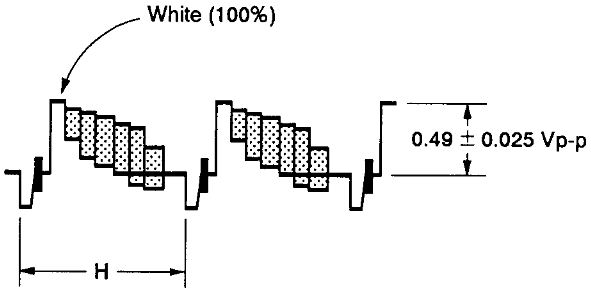


Fig. 9-16. SYNC AGC adjustment

9-5-7. Emphasis Input Level Adjustment (VS-91 Board)

Mode	Recording
Signal	Color bar
Measurement Point	Pin (54) of IC203
Measuring Instrument	Oscilloscope
Adjustment Element	RV205
Specified Value	0.50 ± 0.025 Vp-p

Adjustment method:

1) Adjust with RV205 so that it becomes 0.50 ± 0.025 Vp-p.
2) Always perform "PB Y Level 2 Adjustment" after this adjustment.

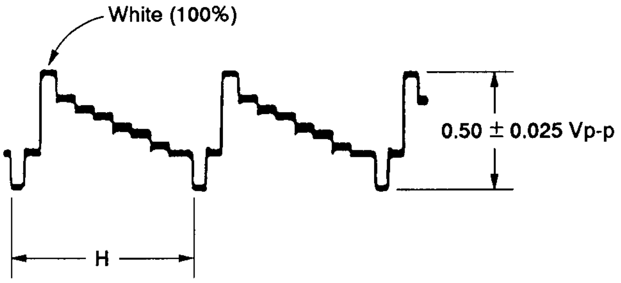


Fig. 9-17. Emphasis input level adjustment

9-5-8. PB Y Level 1 Adjustment (VS-91 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP) Color bar section
Measurement Point	Pin ㊼ of IC203 (Pin ⑤ of IC202)
Measuring Instrument	Oscilloscope
Adjustment Element	RV202
Specified Value	0.50 ± 0.025 Vp-p

Adjusting method:

1) Adjust to 0.50 ± 0.025 Vp-p with RV202.
2) Always perform "PB Y Level 2 Adjustment" after this adjustment.

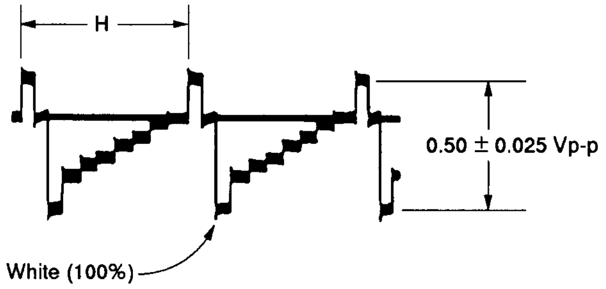


Fig. 9-18. PB Y level 1 adjustment

9-5-9. PB Y Level 2 Adjustment (VS-91 Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP) Color bar section
Measurement Point	VIDEO output terminal (J901)
Measuring Instrument	Oscilloscope
Adjustment Element	RV208
Specified Value	$1.00^{+0.025}_{-0.05}$ Vp-p

Note: 1) Terminate VIDEO OUT (J901) at 75Ω .
2) Make sure that "PB Y Level 1 Adjustment" and "Emphasis Input Level Adjustment" have been completed.

Adjustment method:

1) Adjust with RV208 so that it becomes $1.00^{+0.025}_{-0.05}$ Vp-p.

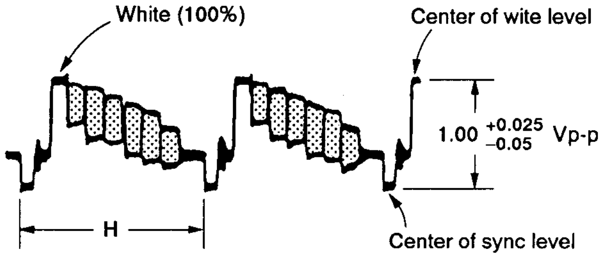


Fig. 9-19. PB Y level 2 adjustment

9-5-10. Y FM Carrier Frequency Adjustment (VS-91 Board)

Mode	Recording
Signal	No signal
Measurement Point	TP161[Note]
Measuring Instrument	Frequency counter
Adjustment Element	RV204
Specified Value	4.39 ± 0.02 MHz

Note: TP161 is the check land. (See Fig. 9-21.)

Adjustment method:

1) Adjust to 4.39 ± 0.02 MHz with RV204.
2) Perform "Deviation Adjustment".

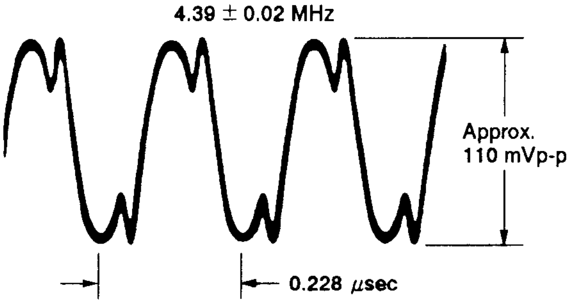


Fig. 9-20. Y FM carrier frequency adjustment

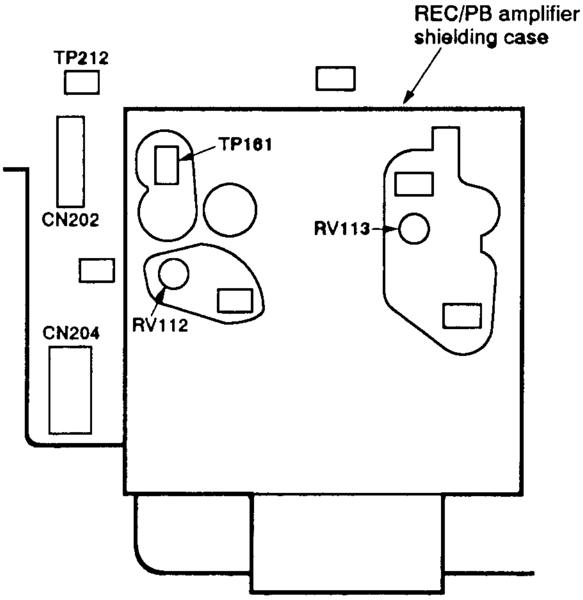


Fig. 9-21.

9-5-11. Y FM Deviation Adjustment (VS-91 Board)

Mode	Recording and playback
Signal	Color bar
Measurement Point	VIDEO output terminal (J901)
Measuring Instrument	Oscilloscope
Adjustment Element	RV203
Specified Value	Playback level is 1.00 ± 0.04 Vp-p

Note: 1) Confirm that "Emphasis Input Level Adjustment", "PB Y Level 2 Adjustment" and "Y FM Carrier Frequency Adjustment" have been completed.
2) Terminate VIDEO OUT (J901) at 75Ω .

Adjustment method:

1) Record the color bar signal.
2) Playback the recorded signal.
3) Confirm the playback output.
Specified value: 1.00 ± 0.04 Vp-p
4) If the specified value is not satisfied, repeat 1) to 3) after turning RV203 in the following manner.

	Rotation direction of RV203
When larger than specified value	Clockwise (○)
When smaller than specified value	Counterclockwise (○)

Table 9-2.

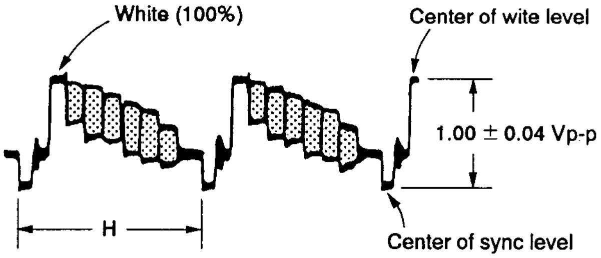


Fig. 9-22. Y FM deviation adjustment

9-5-12. Chroma Emphasis fo Adjustment (VS-91 Board)

Mode	Recording
Signal	Color bar
Measurement Point	TP212 (emitter of Q241)Note
Measuring Instrument	Oscilloscope
Adjusting Element	FL201
Specified Value	Minimum fo component

Note: TP212 is the check land (See Fig. 9-21.)

Adjusting method:

1) Adjust FL201 so that the amplitude of flat red portion of the chroma signal becomes minimum.

9-5-13. REC C RF Level Adjustment (VS-91 Board)

Mode	Recording (SP)
Signal	Color bar
Measurement Point	TP212 (emitter of Q241)Note
Measuring Instrument	Oscilloscope
Adjusting Element	RV210
Specified Value	160 ± 10 mVp-p

Note: TP212 is the check land. (See Fig. 9-21.)

Adjusting method:

1) Adjust RV210 so that the amplitude of flat red portion of the chroma signal becomes 209 ± 10 mVp-p.

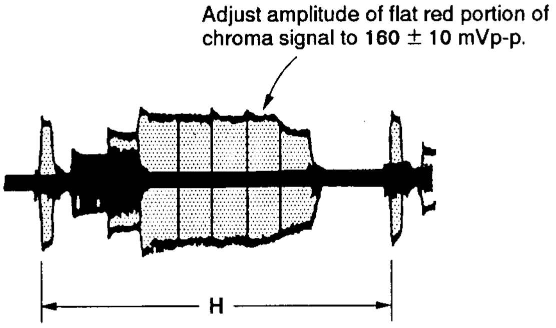

Adjust amplitude of flat red portion of chroma signal to 160 ± 10 mVp-p.
H

Fig. 9-24. REC C RF level adjustment

9-5-14. REC Y Level Adjustment (VS-91 Board)

Mode	Recording (SP)
Signal	No signal
Measurement Point	TP161 (emitter of Q237)Note
Measuring Instrument	Oscilloscope
Adjusting Element	RV209
Specified Value	110 ± 5 mVp-p

Note: TP161 is the check land. (See Fig. 9-21.)

Adjusting method:

1) Adjust RV209 for 110 ± 5 mVp-p.

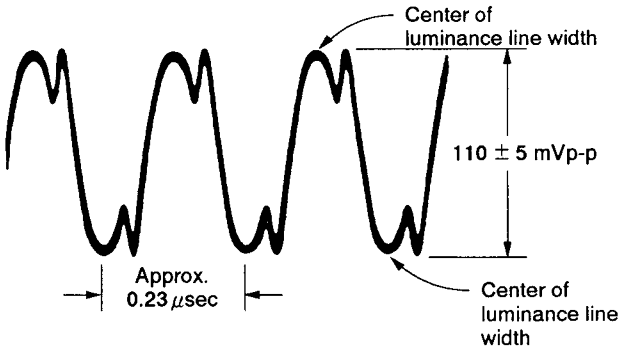

Center of luminance line width
110 ± 5 mVp-p
Approx. 0.23 μsec
Center of luminance line width

Fig. 9-25. REC Y level adjustment

9-5-15. REC ATF Level Checking (VS-91 Board)

Mode	Recording
Signal	No signal
Measurement Point	Emitter of Q543
Measuring Instrument	Oscilloscope
Specified Value	400 ± 40 mVp-p

Checking method:

1) Confirm that the REC ATF signal level is 400 ± 40 mVp-p.

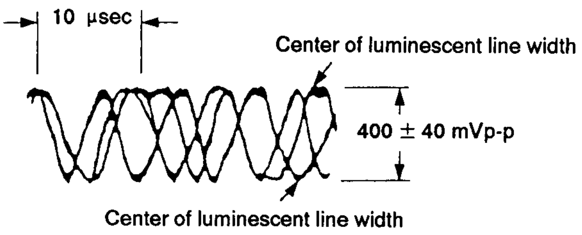

10 μsec
Center of luminescent line width
400 ± 40 mVp-p
Center of luminescent line width

Fig. 9-26. REC ATF level checking

9-5-16. Feedback Chroma Adjustment (CC-52P Board)

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP)
Measurement Point	Emitter of Q205
Measuring Instrument	Oscilloscope
Adjustment Element	RV201

Note: Remove the MD frame assembly to perform adjustments.

Adjusting method:

1) Set RV201 extreme counterclockwise position. (See Fig. 9-30.)
2) Turn RV201 sloely clockwise and stop where the correlative chroma component is minimum.

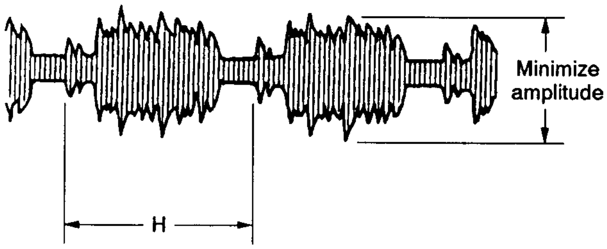


Fig. 9-27.

9-5-17. Quasi Burst Phase Adjustment (VS-91 Board)

1. Method using vectorscope

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP)
Measurement Point	VIDEO output terminal (J901)
Measuring Instrument	Vectorscope
Adjusting Element	RV212
Specified Value	Phase of color luminance points in quasi burst mode is same as phase of color luminance points in through burst mode

Adjusting method:

1) Memorize of the phase of the color luminance points (especially yellow). (Through burst mode)
2) Connect cathode of D216 and Pin ② of CN201 with a diode (1SS119, etc.). (Quasi burst mode)

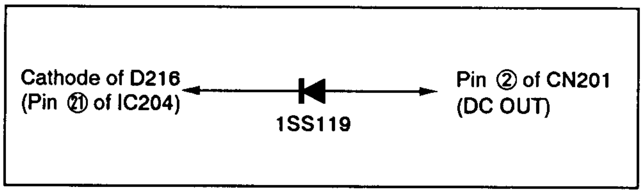


Fig. 9-28.

3) Confirm the color of color bars on the monitor screen. If abnormal, stop the unit and then set the playback mode again.
4) Adjust RV212 so that the phase of the color luminance points is the same as the phase memorized in 1).
5) Remove the diode.

2. Method using monitor TV

Mode	Playback
Signal	Alignment tape for operation check (WR5-5CSP)
Measurement Point	Confirmation on monitor TV screen
Measuring Instrument	
Adjusting Element	RV212
Specified Value	Minimum chroma flickering

Connection:

1) Connect cathode of D216 and Pin ② of CN201 using a diode (1SS119, etc.).

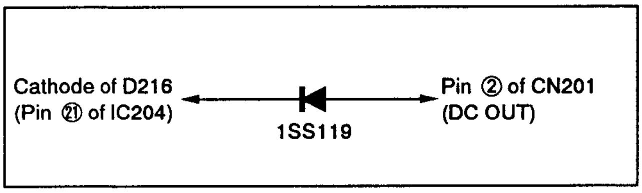

Cathode of D216
(Pin ㉑ of IC204)
1SS119
Pin ② of CN201
(DC OUT)

Fig. 9-29.

Adjusting method:

1) Observe the monitor screen. If color is abnormal, stop the unit and then set the playback mode again.
2) Set the monitor color level to maximum and its bright level to minimum.
3) Rotate RV212 fully in the counterclockwise direction (↺).
4) Turn RV212 slowly clockwise and stop where chroma flicker is minimum and horizontal black stripes are least visible.
5) Remove the diode.

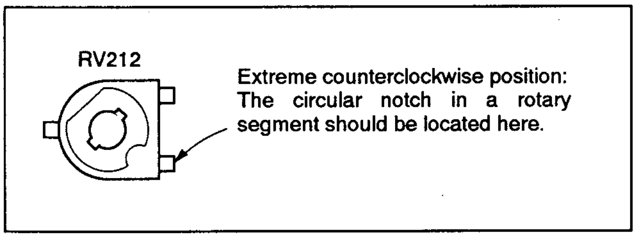

RV212
Extreme counterclockwise position:
The circular notch in a rotary segment should be located here.

Fig. 9-30.

9-5-18. Delay Burst Phase Adjustment (VS-91 Board)

Mode	Playback pause (LP mode)
Signal	Alignment tape for operation check (WR5-4CL) color bars
Measurement Point	Confirmation on monitor TV screen
Measuring Instrument	
Adjusting Element	RV213
Specified Value	Minimum chroma flickering

Adjusting method:

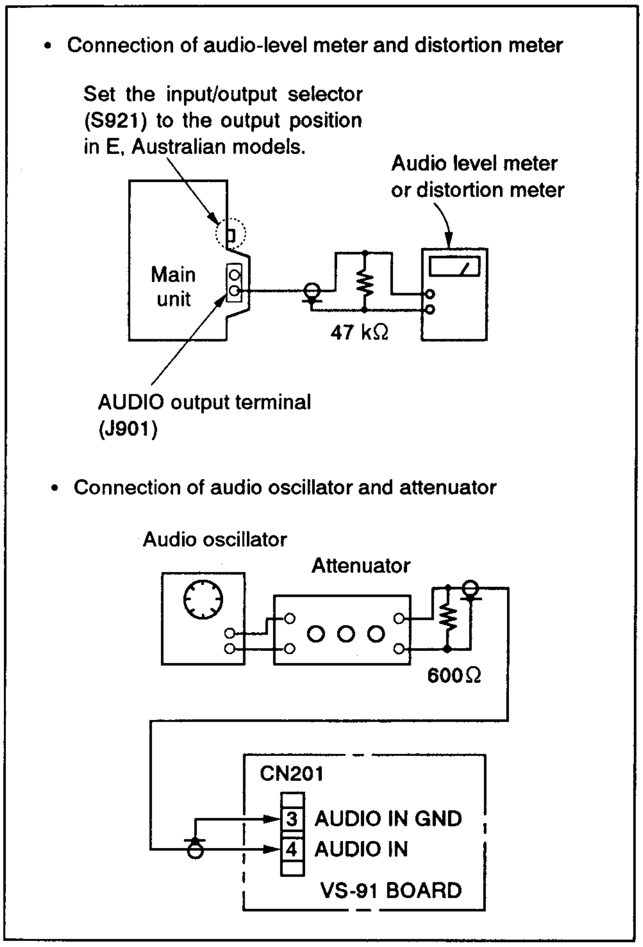
1) Set the monitor TV color level to maximum and its bright level to minimum.
2) Minimize chroma flicker with RV213 so that horizontal black stripes cannot longer be seen.

9-6. AUDIO SYSTEM ADJUSTMENT

- Perform adjustment with the color bar signal used as the video input signal.

[Connection of audio measuring instruments]
In addition to the video system measuring instruments, connect the audio system measuring instruments as shown in the figure below, and set the power switch to "PLAYER"(*1) position for adjustment.

*1: "VTR" in E, Australian modeles.



• Connection of audio-level meter and distortion meter
Set the input/output selector (S921) to the output position in E, Australian models.
Audio level meter or distortion meter
Main unit
47 kΩ
AUDIO output terminal (J901)
• Connection of audio oscillator and attenuator
Audio oscillator
Attenuator
600Ω
CN201
3 AUDIO IN GND
4 AUDIO IN
VS-91 BOARD

Fig. 9-31.

9-6-1. AFM Carrier Frequency Adjustment (AU-132 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ⑬ of IC401(REC AFM) (JL419)
Measuring Instrument	Frequency counter
Adjusting Element	RV401
Specified Value	1.505 ± 0.002 MHz

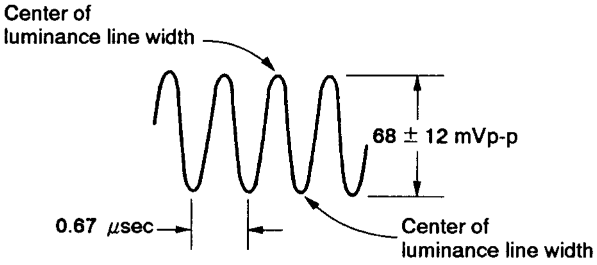
Note: Connect the frequency counter through a buffer amplifier (oscilloscope, etc.) of high impedance and low capacitance.

Adjustment method:
1) Turn OFF the audio oscillator output.
2) Adjust RV401 so that the AFM carrier frequency is 1.505 ± 0.002 MHz.

9-6-2. REC AFM Carrier Level Check (AU-132 Board)

Mode	Recording
Signal	Non-signal
Measurement Point	Pin ⑧ of CN401 (REC AFM)
Measuring Instrument	Oscilloscope
Specified Value	68 ± 12 mVp-p

Checking method:
1) Confirm that the level is 68 ± 12 mVp-p.



Center of luminance line width
68 ± 12 mVp-p
0.67 μsec
Center of luminance line width

Fig. 9-32. REC AFM carrier level

9-6-3. AFM Deviation Adjustment (AU-132 Board)

Mode	Playback
Signal	Alignment tape: For operation checking (WR5-5CSP)
Measurement Point	Audio output terminal (J901)
Measuring Instrument	Audio level meter
Adjusting Element	RV402
Specified Value	-7.5 ± 0.2 dBs

Checking method:
1) Adjust RV402 so that the audio output level is -7.5 ± 0.2 dBs.

9-6-4. E-E Output Level Check

Mode	E-E
Signal	400 Hz, –7.5 dBs
Measurement Point	Audio output terminal (J901)
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 2 dBs

Checking method:

1) Make sure that the audio output level is –7.5 ± 2 dBs.

9-6-5. Overall Level Characteristics Check

Mode	Self-recording and playback (SP)
Signal	400 Hz, –7.5 dBs
Measurement Point	Audio output terminal (J901)
Measuring Instrument	Audio level meter
Specified Value	–7.5 ± 3 dBs

Checking method:

1) Record the signal.
2) Playback the recorded section.
3) Make sure that the audio output level is –7.5 ± 3 dBs.

9-6-6. Overall Frequency Characteristics Check

Mode	Self-recording and playback (SP)
Signal	Ⓐ 400 Hz, –17.5 dBs Ⓑ 30 Hz, –17.5 dBs Ⓒ 14 kHz, –17.5 dBs
Measurement Point	Audio output terminal (J901)
Measuring Instrument	Audio level meter
Specified Value	With the 400 Hz playback output level as 0 dB, the playback output level of 30 Hz and 14 kHz is 0 ± 3 dB

Checking method:

1) Record signal Ⓐ through Ⓒ in order.
2) Playback the recorded sections.
3) With the 400 Hz playback output level as 0 dB, confirm that the playback output level of 30 Hz and 14 kHz is 0 ± 3 dB.

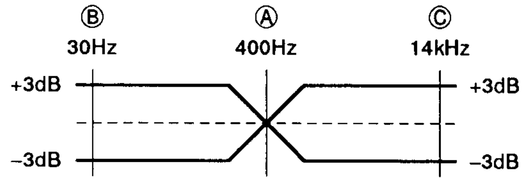


Fig. 9-33. AFM overall frequency characteristics

9-6-7. Overall Distortion Check

Mode	Self recording and playback (SP)
Signal	400 Hz, –7.5 dBs
Measurement Point	Audio output terminal (J901)
Measuring Instrument	Distortion meter
Specified Value	Less than 0.5% *1

Checking method:

1) Record the signal.
2) Playback the recorded section.
3) Confirm that the distortion is less than 0.5%. *1

[*1] Value when 200 Hz to 6 kHz 18dB/oct BPF is used.
When the filter is not used ...... less than 1.0%

9-6-8. Overall Noise Level Check

Mode	Self-recording and playback (SP)
Signal	No signal (shorting plug is inserted into audio input terminal)
Measurement Point	Audio output terminal (J901)
Measuring Instrument	Audio level meter
Specified Value	Less than – 67.5 dBs*2

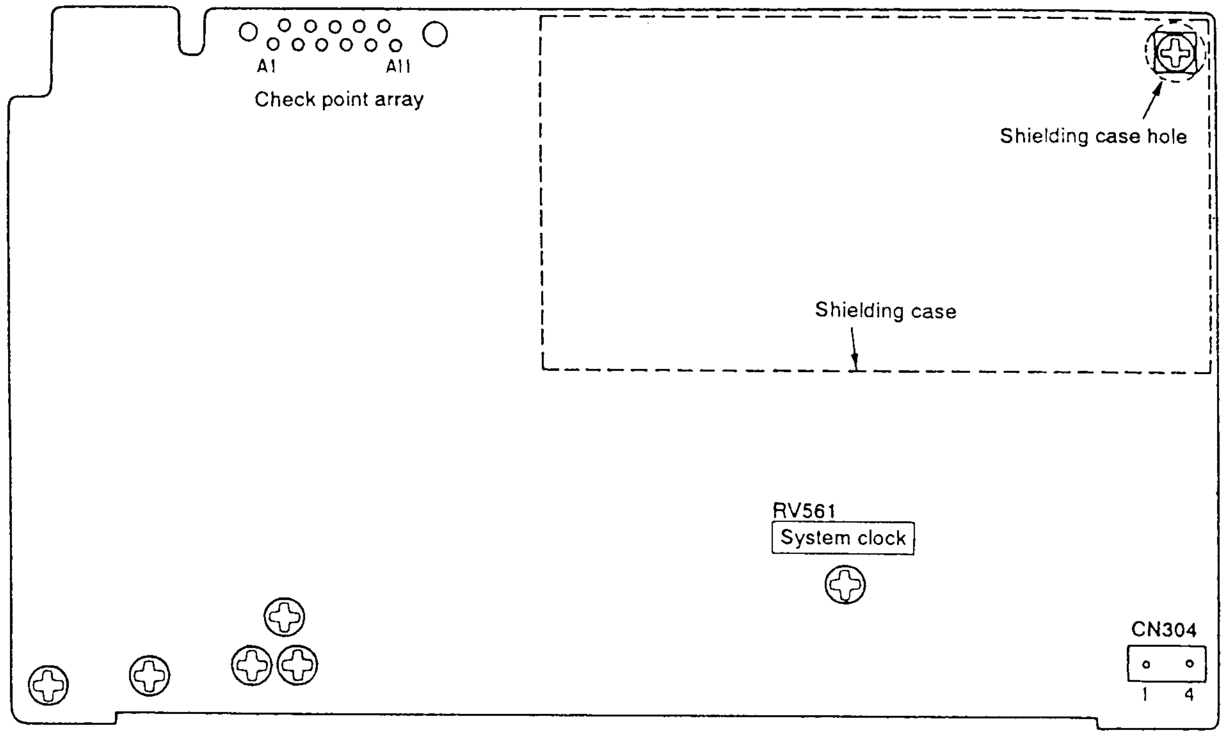
Checking method:

1) Record the signal.
2) Playback the recorded section.
3) Make sure that the noise level is less than –67.5 dBs. *2

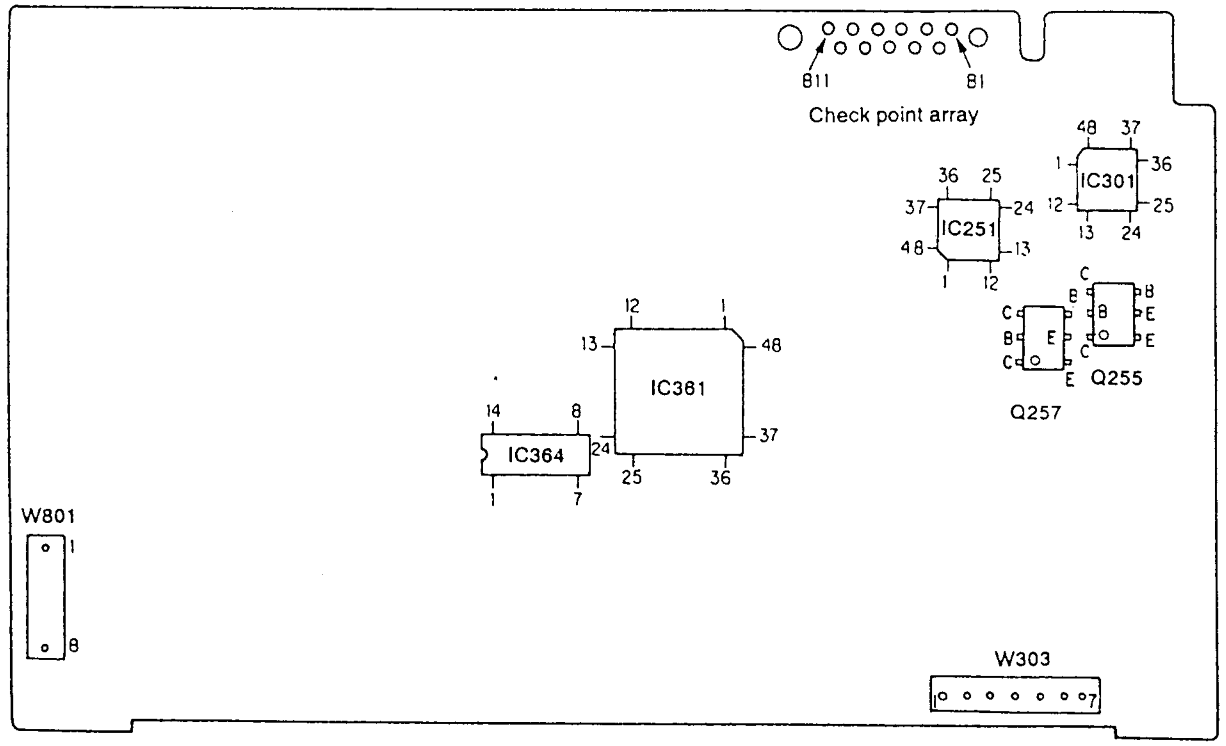
[*2] Value when IHF-A hearing correction filter is used.

9-7. ARRANGEMENT DIAGRAMS FOR ADJUSTMENT PARTS

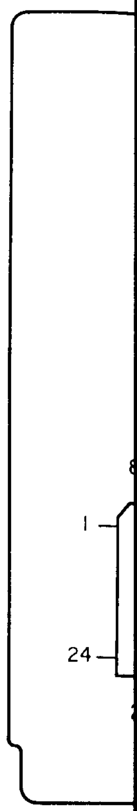
VC-117 BOARD (COMPONENT SIDE)
(Also illustrated on page 232.)


A1
A11
Check point array
Shielding case hole
Shielding case
RV561
System clock
CN304
1
4

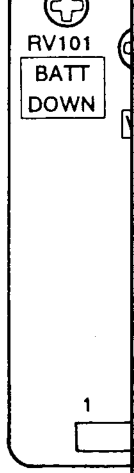
VC-117 BOARD (CONDUCTOR SIDE)
(Also illustrated on page 232.)


B11
B1
Check point array
48
37
1
36
12
25
13
24
IC301
36
25
37
24
48
13
1
12
IC251
C
B
E
C
B
E
C
B
E
C
E
Q255
Q257
12
1
13
48
IC381
37
25
36
14
8
IC364
24
1
7
W801
1
8
W303
1
7

VS-91 BO



DD-31P B


RV101
BATT
DOWN
1

ck (SP)

01)

F is used.
.0%

ck (SP)

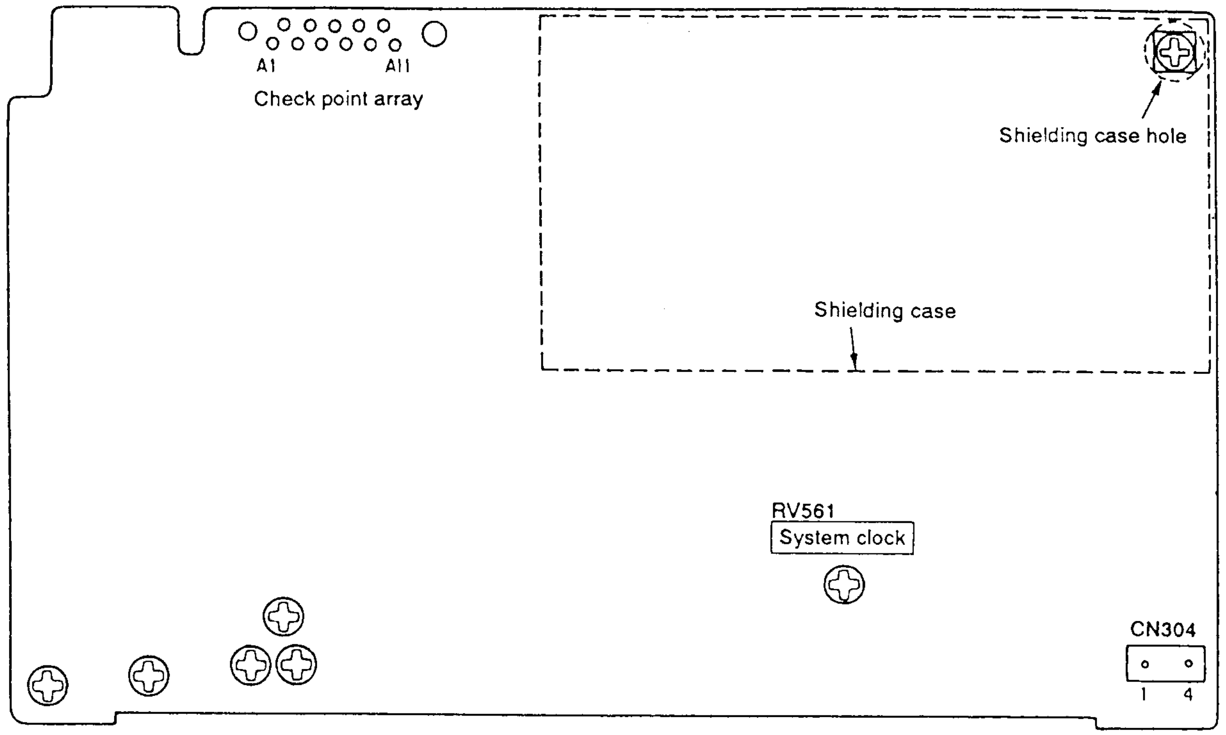
into audio

01)

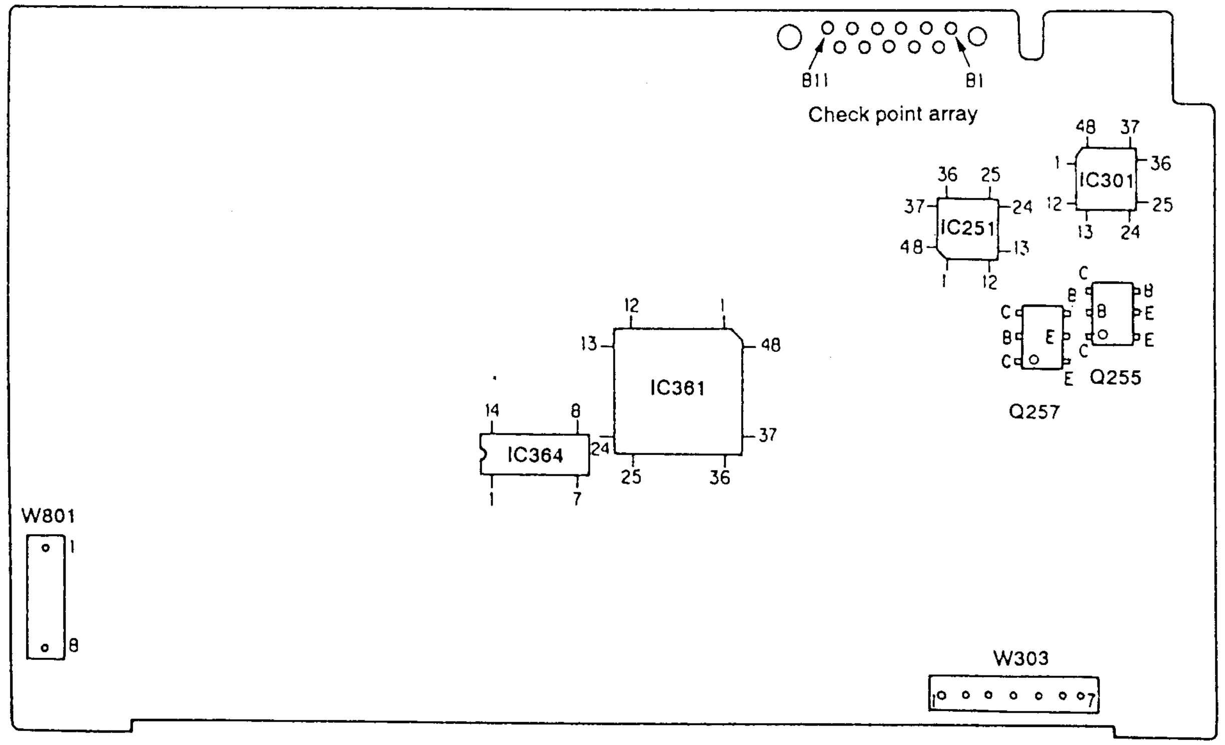
dBs. *2
r is used.

9-7. ARRANGEMENT DIAGRAMS FOR ADJUSTMENT PARTS

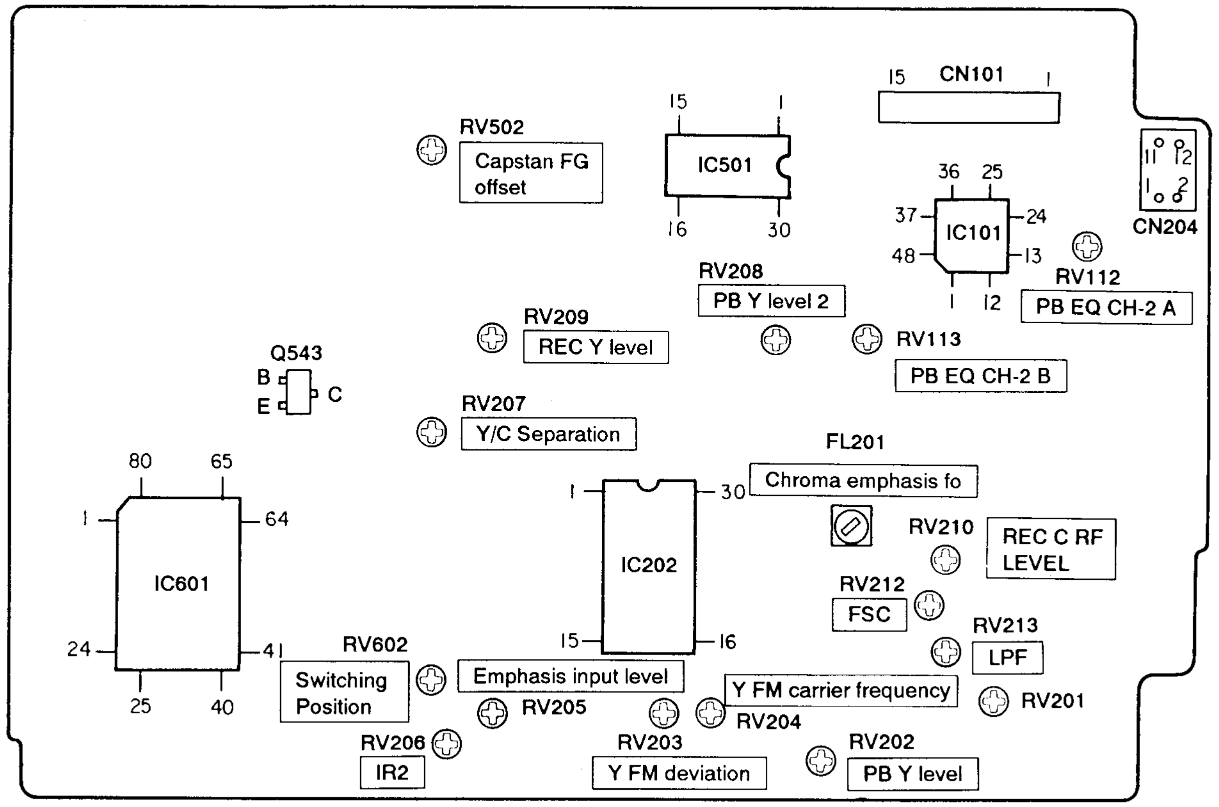
VC-117 BOARD (COMPONENT SIDE)
(Also illustrated on page 232.)


A1
A11
Check point array
Shielding case hole
Shielding case
RV561
System clock
CN304
1
4

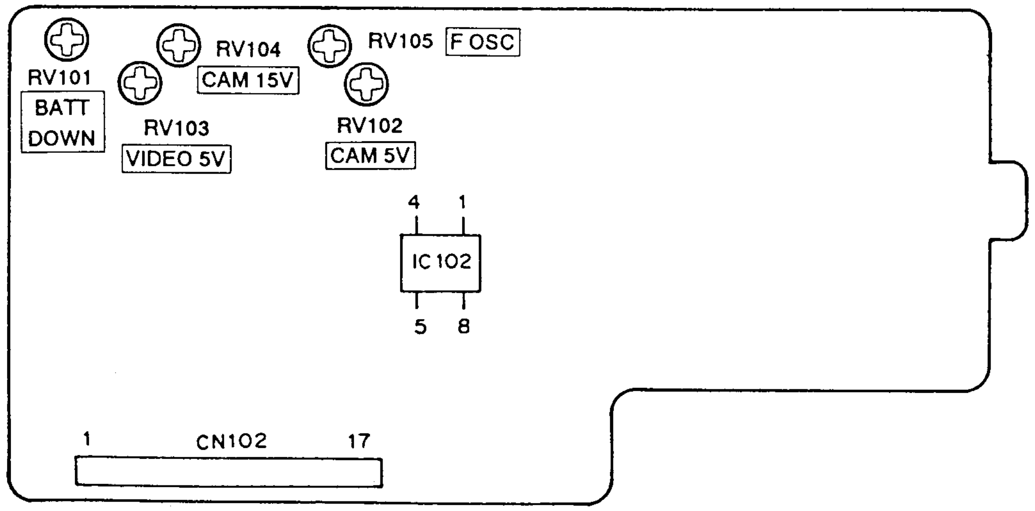
VC-117 BOARD (CONDUCTOR SIDE)
(Also illustrated on page 232.)


B11
B1
Check point array
IC301
IC251
Q255
Q257
IC361
IC364
W801
W303

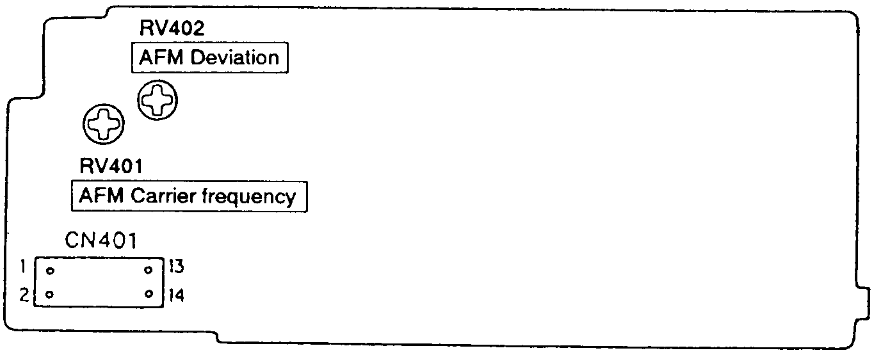
VS-91 BOARD (COMPONENT SIDE)


CN101
CN204
IC501
IC101
RV502
Capstan FG offset
RV208
PB Y level 2
RV112
PB EQ CH-2 A
RV209
REC Y level
RV113
PB EQ CH-2 B
Q543
RV207
Y/C Separation
FL201
Chroma emphasis fo
IC601
IC202
RV210
REC C RF LEVEL
RV212
FSC
RV213
LPF
RV602
Switching Position
Emphasis input level
Y FM carrier frequency
RV201
RV205
RV204
RV206
IR2
RV203
Y FM deviation
RV202
PB Y level

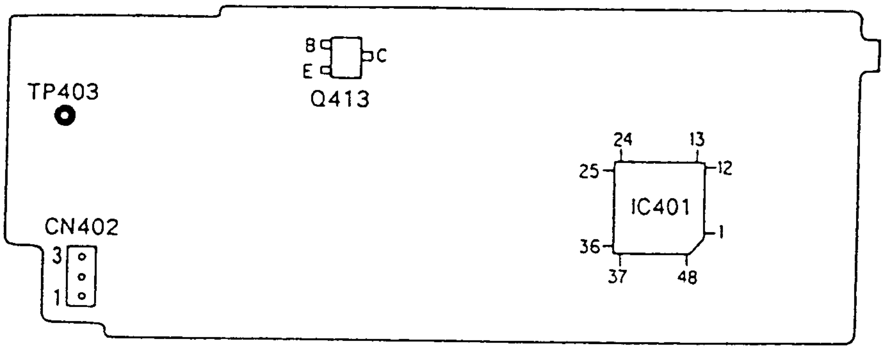
DD-31P BOARD (COMPONENT SIDE)


RV101
BATT DOWN
RV104
CAM 15V
RV103
VIDEO 5V
RV105
F OSC
RV102
CAM 5V
IC 102
CN102
1
17

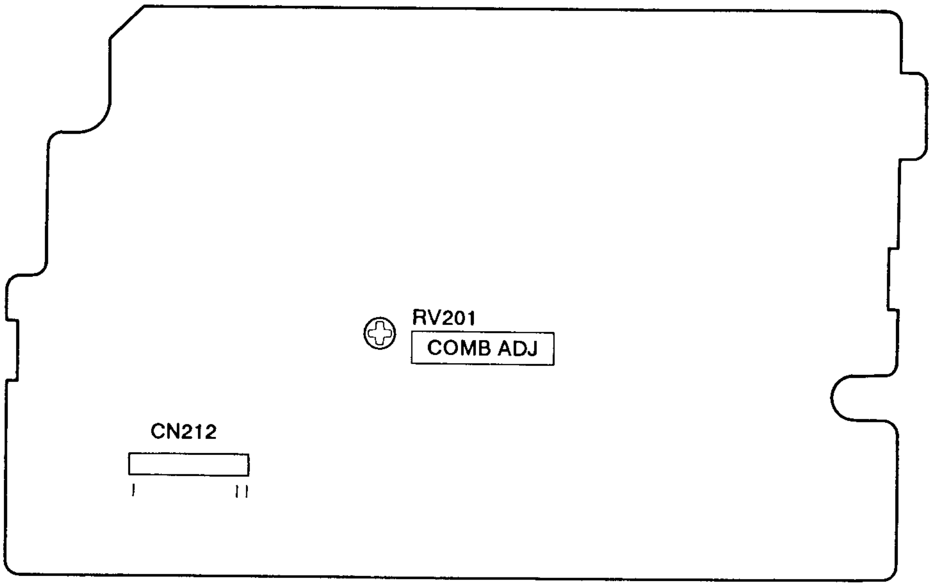
AU-132 BOARD (COMPONENT SIDE)

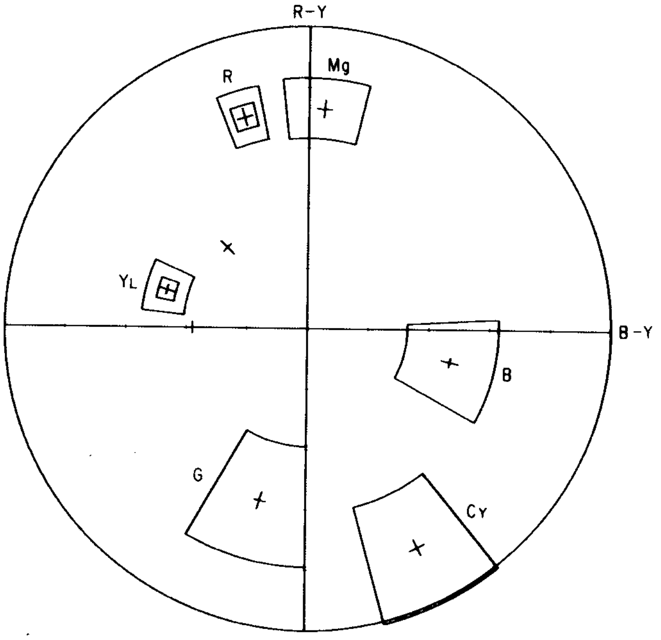

RV402
AFM Deviation
RV401
AFM Carrier frequency
CN401
1
2
13
14

AU-132 BOARD (CONDUCTOR SIDE)

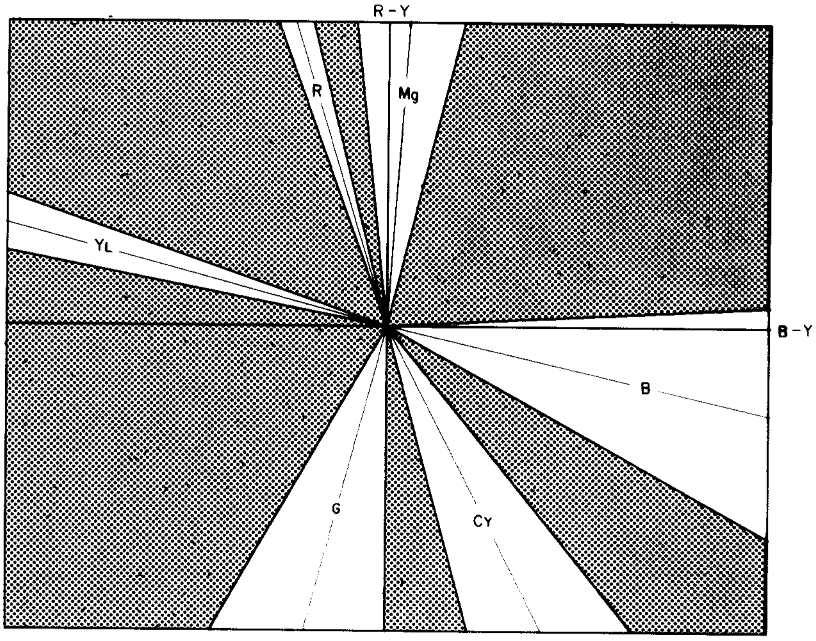

B
E
C
Q413
TP403
24
13
25
12
IC401
1
36
37
48
CN402
3
1

CC-52P BOARD (CONDUCTOR SIDE)


RV201
COMB ADJ
CN212
1
11


R-Y
R
Mg
YL
B-Y
B
G
CY

For Vectorscope


R-Y
R
Mg
YL
B-Y
B
G
CY

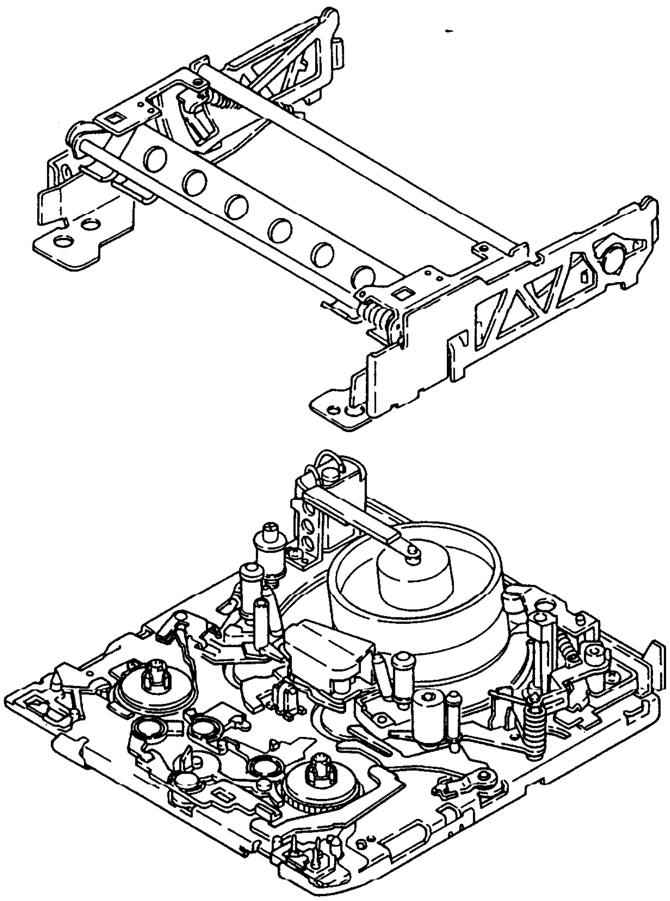
For Oscilloscope

mm Video MECHANICAL ADJUSTMENT MANUAL III

U MECHANISM

Video8

Please use in conjunction with the SERVICE MANUAL.



8 MECHANISM DECK

SONY®

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1. PREPARATIONS FOR MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

Note: For removal of the cabinet, the boards, the cassette compartment, etc., refer to the service guides.

1-1. OPERATION WITHOUT CASSETTE COMPARTMENT ASSEMBLY AND TAPE

Note: The unit will not work if exposed to a strong light.

1-1-1. How to Trigger the Loading Operation (See Fig. 1-1.)

1) Supply power to the unit after removing the cabinet, the camera block, the cassette compartment assembly, etc., as indicated in the service guides. (This will enable operation of the mechanical deck.)
2) Cover the LED assembly with an opaque cap, etc. ❶.
3) Attach a piece of tape to the RECOG switch ❷ so that the pin is held down.
4) Push the EJECT lever ❸ in the direction of the arrow Ⓐ.

1-1-2. Setting the Playback Mode (See Fig. 1-1.)

1) Follow the procedures in section 1-1-1. above.
2) Put the rubber band ❹ around the S and T reels.
3) Press the PLAY switch of unit, then push the tension regulator arm assembly ❺ in the direction of the arrow Ⓑ when the T reel starts to rotate (the tension regulator band will be released, and the S reel will start rotating).
4) To stop operation, press the STOP switch.

1-1-3. Eject Operation (See Fig. 1-1.)

1) To eject, turn the EJECT switch on.

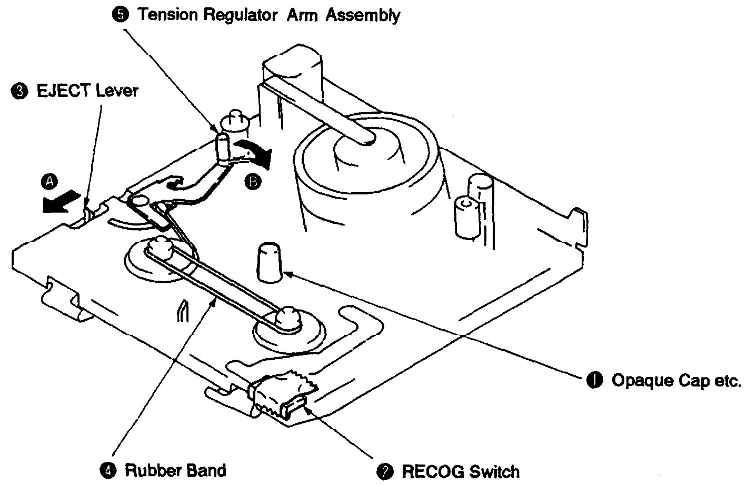


Fig. 1-1.

1-2. THE MODE SELECTOR

1-2-1. Name of Each Part (external) (See Fig. 1-2.)

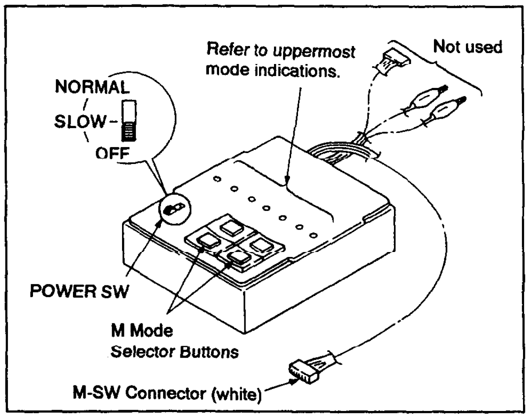

Refer to uppermost mode indications.
Not used
NORMAL
SLOW
OFF
POWER SW
M Mode Selector Buttons
M-SW Connector (white)

Fig. 1-2.

1-2-2. Connections (See Fig. 1-3.)

1) Mount the MODE SELECTOR III panel (Ref. No. J-9) ① onto the mode selector.
2) Attach the conversion connector (Ref. No. J-8) ③ of MODE SELECTOR III to the 6-pin connector (white) ② of the mode selector M-SW.
3) Remove the FP-89 flexible board ⑤ from the flexible connector ④.
4) Attach the FP-89 flexible board ⑤ to the flexible connector ⑥ of the MODE SELECTOR III conversion connector ③, then attach the 2-pin connector (white) ⑧ of the loading motor to the 2-pin connector (white) ⑦.

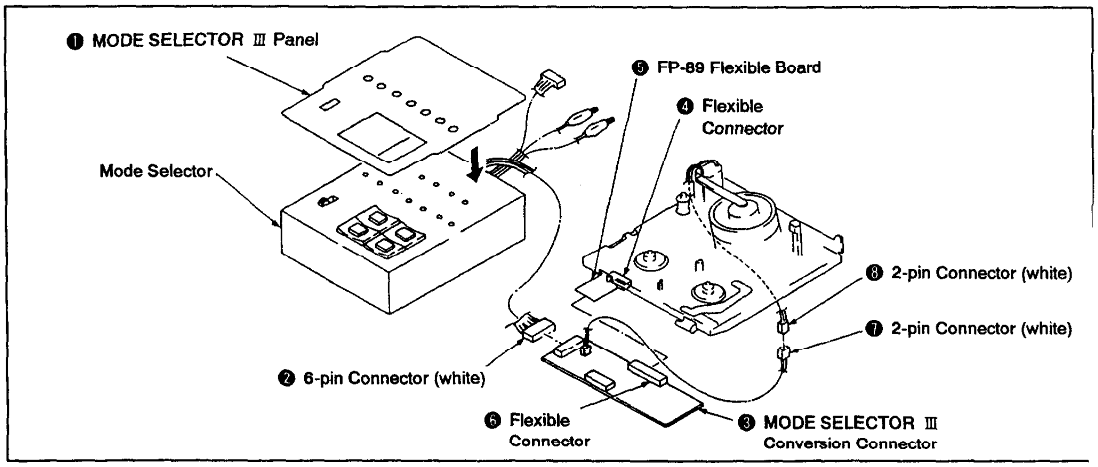

① MODE SELECTOR Ⅲ Panel
Mode Selector
⑤ FP-89 Flexible Board
④ Flexible Connector
⑧ 2-pin Connector (white)
⑦ 2-pin Connector (white)
② 6-pin Connector (white)
⑥ Flexible Connector
③ MODE SELECTOR Ⅲ Conversion Connector

Fig. 1-3.

1-2-3. Handling (See Figs. 1-2. and 1-4.)

- Use only the M mode selector buttons.
- Refer to mode indications on the uppermost part of the MODE SELECTOR III panel.
- If the right M mode selector button is kept pressed, the lit indication will change in the order of EJECT → (IA) → ULD → (IB) → STOP → (IC) → FWD.
- To change modes in the reverse direction (from FWD to EJECT), press the left selector button.

Note: For this U mechanism, the uppermost indicators on the MODE SELECTOR III panel are used. The IA, IB and IC indications light up during mode changes.

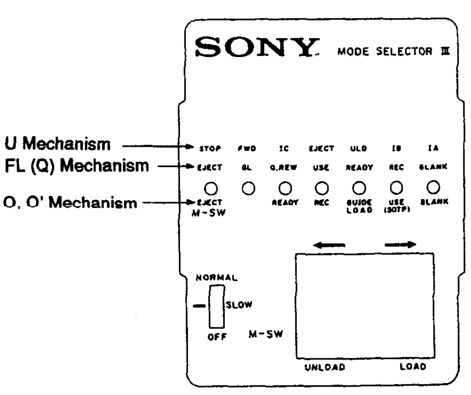

SONY MODE SELECTOR Ⅲ
U Mechanism
FL (Q) Mechanism
O, O' Mechanism
STOP
FWD
IC
EJECT
ULD
IB
IA
EJECT
GL
Q.REW
USE
READY
REC
BLANK
EJECT
M-SW
READY
REC
GUIDE LOAD
USE (SOTP)
BLANK
NORMAL
SLOW
OFF
M-SW
UNLOAD
LOAD

Fig. 1-4.

2. PERIODICAL CHECK AND MAINTENANCE (See Fig. 2-1.)

The following periodical check and maintenance procedures are necessary to ensure proper operation and to protect the tapes as well as the unit, and the following maintenance procedures must be always carried out after repairing regardless of how long the unit has been used.

2-1. ROTARY DRUM ASSEMBLY CLEANING

1) While pressing a piece of chamois leather (Ref. No. J-2) moistened in cleaning fluid (Ref. No. J-1) lightly against the rotary drum, turn the rotary upper drum slowly counter-clockwise with your fingers.

Note: Do not drive the drum with the motor, and do not turn it clockwise.
Do not move the chamois leather vertically against the head tip; this can damage the head tip. Strictly follow the cleaning instructions above.

2-2. TAPE PATH CLEANING

1) Set the cassette compartment assembly to the eject state, or remove it. Then clean the tape path (guides No. 1 to 7, capstan shaft, pinch rollers) with a piece of chamois leather moistened in cleaning fluid (See Fig. 2-1).

2-3. DRIVE SYSTEM CLEANING

1) Clean the drive system (timing belt, reel table surface) with a piece of cloth moistened in cleaning fluid.

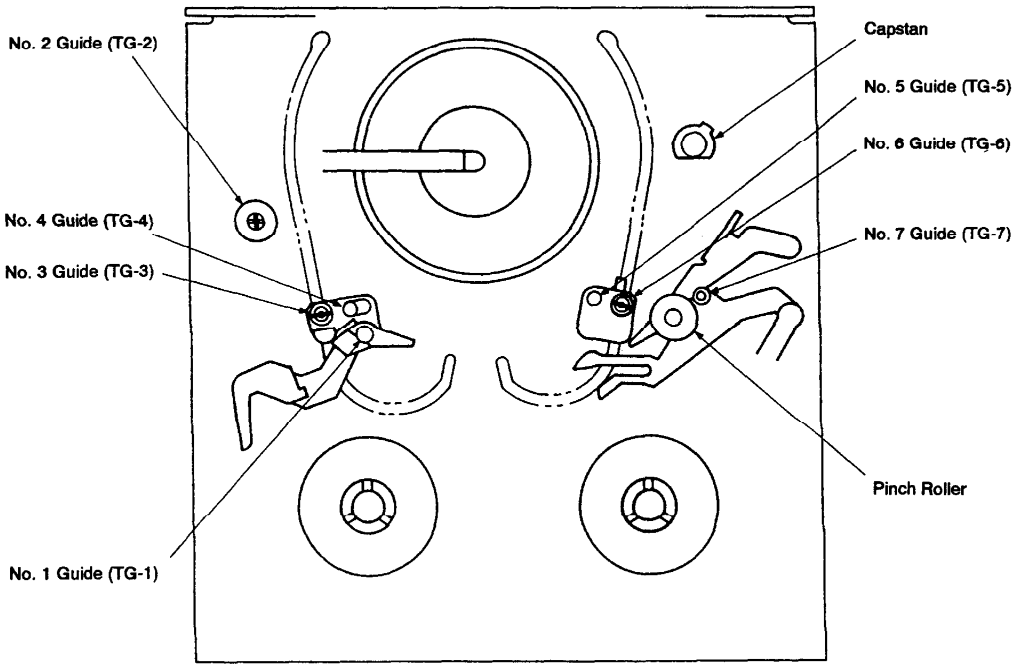


Fig. 2-1.

2-4. PERIODICAL CHECK ITEMS

○Cleaning ◎Lubrication ☆Check

Maintenance and Check Item		Operation time (H)										Remarks
		500	1,000	1,500	2,000	2,500	3,000	3,500	4,000	4,500	5,000	
Cleaning and Demag-netizing	Tape path surfaces Cleaning	○	○	○	○	○	○	○	○	○	○	Do not oil.
	Rotary drum assembly cleaning and demagnetizing	○	○	○	○	○	○	○	○	○	○	Do not oil.
Drive System	Relay belt (short)	–	☆	–	☆	–	☆	–	☆	–	☆	3-728-866-01
	Relay belt (long)	–	☆	–	☆	–	☆	–	☆	–	☆	3-728-865-01
	Capstan shaft	–	◎	–	◎	–	◎	–	◎	–	◎	Take care that no oil gets on tape path surfaces.
	Idler pulley axle	–	◎	–	◎	–	◎	–	◎	–	◎	
	Loading motor	–	☆	–	☆	–	☆	–	☆	–	☆	1-541-612-11
Perfor-mance Check	Abnormal noise	☆	☆	☆	☆	☆	☆	☆	☆	☆	☆	
	Back tension measurement	–	☆	–	☆	–	☆	–	☆	–	☆	
	Brake system	–	☆	–	☆	–	☆	–	☆	–	☆	
	FWD, RVS torque measurement	–	☆	–	☆	–	☆	–	☆	–	☆	

Notes: When overhauling the unit, perform parts replacement referring to the table above.

Regarding Oil:

- Always use the specified oil (using oil of different viscosity, etc. can cause troubles of several kinds).
  Specified oil: Part No. 7-661-018-01
  (Mitsubishi Diamond Oil Hydrofluid EP56)
- Be sure that no dirt is mixed in the oil to be used on axle bearings. Use of dirty oil can result in bearing wear and burning.
- By "one drop of oil" is meant the quantity of oil adhering to the end of a a 2mm-diameter rod as shown in Fig. 2-2.

On grease:

- Use the specified grease.
  Grease: Part No. 7-662-010-08
  (Sony grease SGL-701)

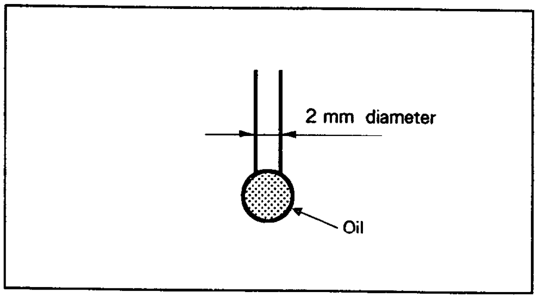


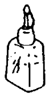
Fig. 2-2.

2-5. SERVICING TOOLS

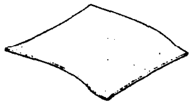
Ref. No.	Name	Part Code	Marking	Application, etc.
J-1	Cleaning fluid	Y-2031-001-0	–	
J-2	Chamois cloth	2-034-697-00	–	
J-3	Head demagnetizer	Commercially available	–	
J-4	Dental mirror Spare mirror	J-6080-029-A J-6080-030-1	SL-5052	Tape path
J-5	Alignment tape NTSC (WR5-1N) PAL (WR5-1C)	8-967-995-01 8-967-995-06		Tape path
J-6	FWD/RVS takeup torque cassette	J-6080-624-A	GD-2086	
J-7	Rotary drum jig	(Attached to the maintenance rotary upper drum)		
J-8	Mode selector III conversion connector	J-6082-021-A		General
J-9	Mode selector III panel	J-6082-023-A		General
J-10	Mode selector	J-6080-825-A		General
J-11	Hexagonal wrench detection (0.89 mm) or L wrench (0.89 mm)	7-700-766-01 7-700-736-06		Tape path
J-12	Sony grease (SGL-701)	7-662-010-08		

Other devices: Oscilloscope
Analog tester (20 kΩ)

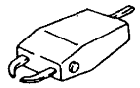
J-1



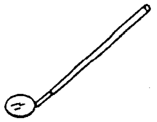
J-2



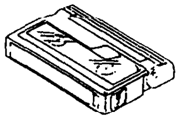
J-3



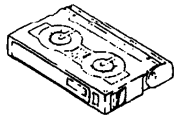
J-4



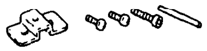
J-5



J-6

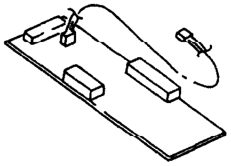


J-7

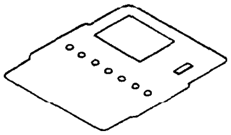


(Attached to the maintenance rotary upper drum)

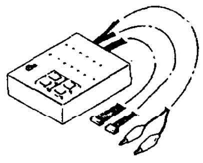
J-8



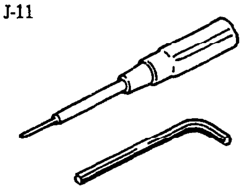
J-9



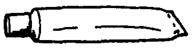
J-10



J-11



J-12



3. MECHANICAL BLOCK CHECK, ADJUSTMENT AND REPLACEMENT

Notes:
- Use the mode selector (Ref. No. J-10) for procedures in this chapter.
- Modes within a frame ☐ are those set by pressing the buttons of the mode selector.

3-1. HC ROLLER ASSEMBLY

1. Removal (See Fig. 3-1.)

1) Remove the screw ❶, then remove the HC roller assembly ❷.

2. Installation (See Fig. 3-1.)

1) Align the two dowels ❸ attached to the HC roller assembly ❷ with the two holes ❹ in the mechanism chassis.
2) Secure the HC roller assembly ❷ with the screw ❶.

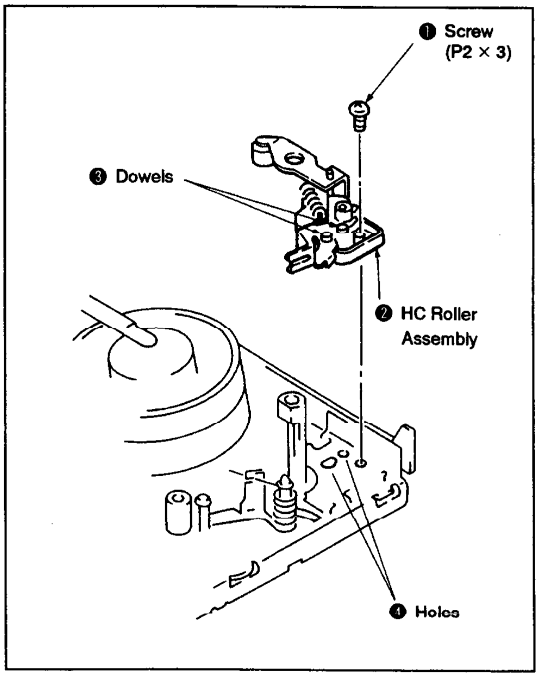

❶ Screw
(P2 × 3)
❸ Dowels
❷ HC Roller
Assembly
❹ Holes

Fig. 3-1.

3-2. GUIDE GUARD ASSEMBLY

1. Removal (See Fig. 3-2.)

Remove the screw ❶, then remove the guide guard assembly ❷.

2. Installation (See Fig. 3-2.)

1) Align the dowel ❸ attached to the guide guard assembly ❷ with the hole ❹.
2) Secure the guide guard assembly ❷ with the screw ❶.

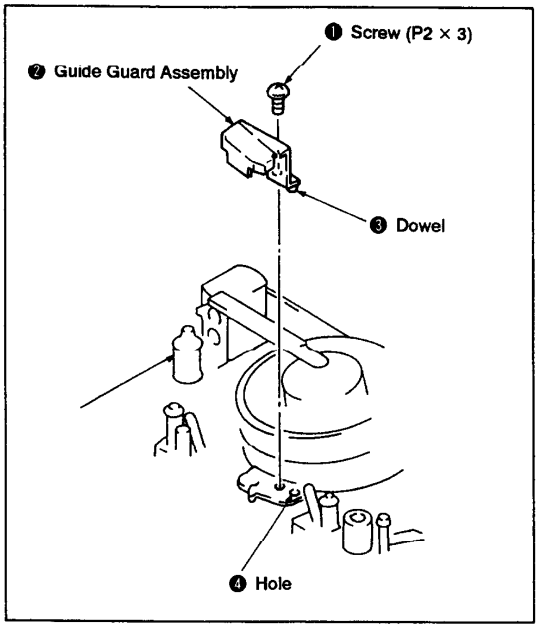

❶ Screw (P2 × 3)
❷ Guide Guard Assembly
❸ Dowel
❹ Hole

Fig. 3-2.

3-3. DC MOTOR (CAPSTAN MOTOR) ASSEMBLY

1. Removal (See Fig. 3-3.)

1) Set the ULD mode.
2) Turn the stopper ❶ in the direction of the arrow Ⓐ as far as it will go.
3) Remove the two screws ❷, then remove the DC motor ❸.

2. Installation (See Fig. 3-3.)

1) Align the two screwed dowels ❹ with the two holes ❺, then engage the toothed part ❻ with the connecting gear ❼.
2) Secure the DC motor assembly ❸ with the two screws ❷.
3) Turn the stopper ❶ in the direction of the arrow Ⓑ as far as it will go.

Note:
- When engaging the gears, take care not to damage their teeth.
- Do not leave any clearance between the DC motor ❸ and the chassis.
- Do not touch the capstan motor axle*, the oil seal* and the rotor*.

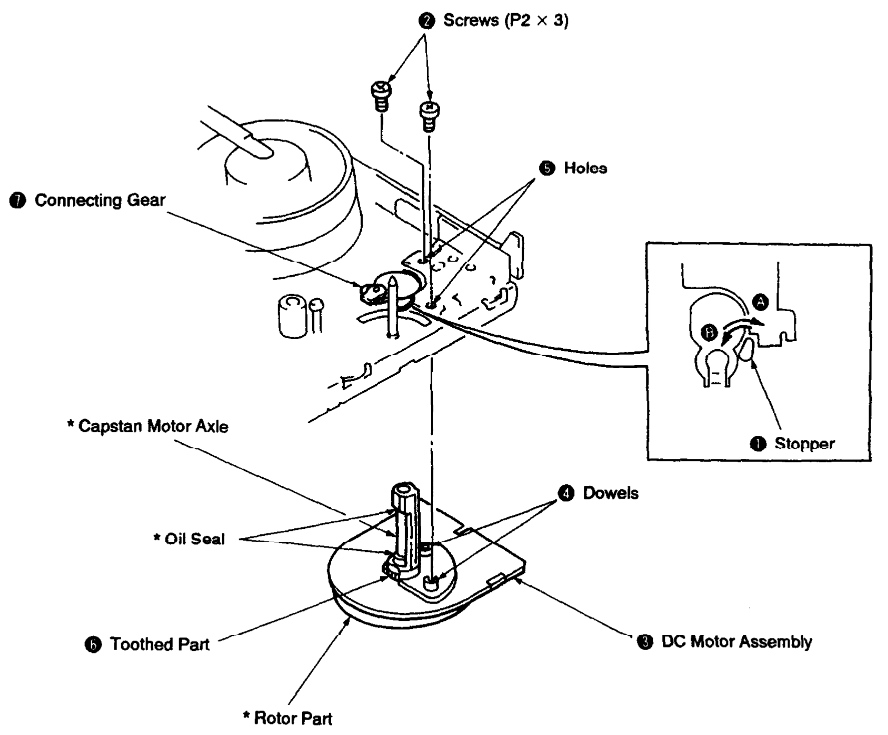

❷ Screws (P2 × 3)
❺ Holes
❼ Connecting Gear
Ⓐ
Ⓑ
❶ Stopper
* Capstan Motor Axle
❹ Dowels
* Oil Seal
❻ Toothed Part
❸ DC Motor Assembly
* Rotor Part

Fig. 3-3.

3-4. S BRAKE, T BRAKE

1. Removal (See Fig. 3-4.)

1) Remove the torsion coil spring (ST) ❶.
2) Remove the axle holding pin ❷, then remove the T brake ❸.
3) Remove the axle holding pin ❹, then remove the S brake ❺.

2. Installation (See Fig. 3-4.)

1) While fitting the toothed part ❻ into the notch ❼, mount the S brake ❺.
2) Insert the axle holding pin ❹.
3) Insert the axle ❽ to the S reel side of the brake release arm ❾ so that the Ⓐ part comes closer to the drum than part Ⓑ, and mount the T brake ❸.
4) Insert the axle holding pin ❷.
5) Insert the torsion coil spring (ST) ❶ below the claw ⓫ of the axle ❿, then hook it to two claws ⓬.

Note: Confirm that the claws of axle holding pins ❷ and ❹ are not broken before assembling.

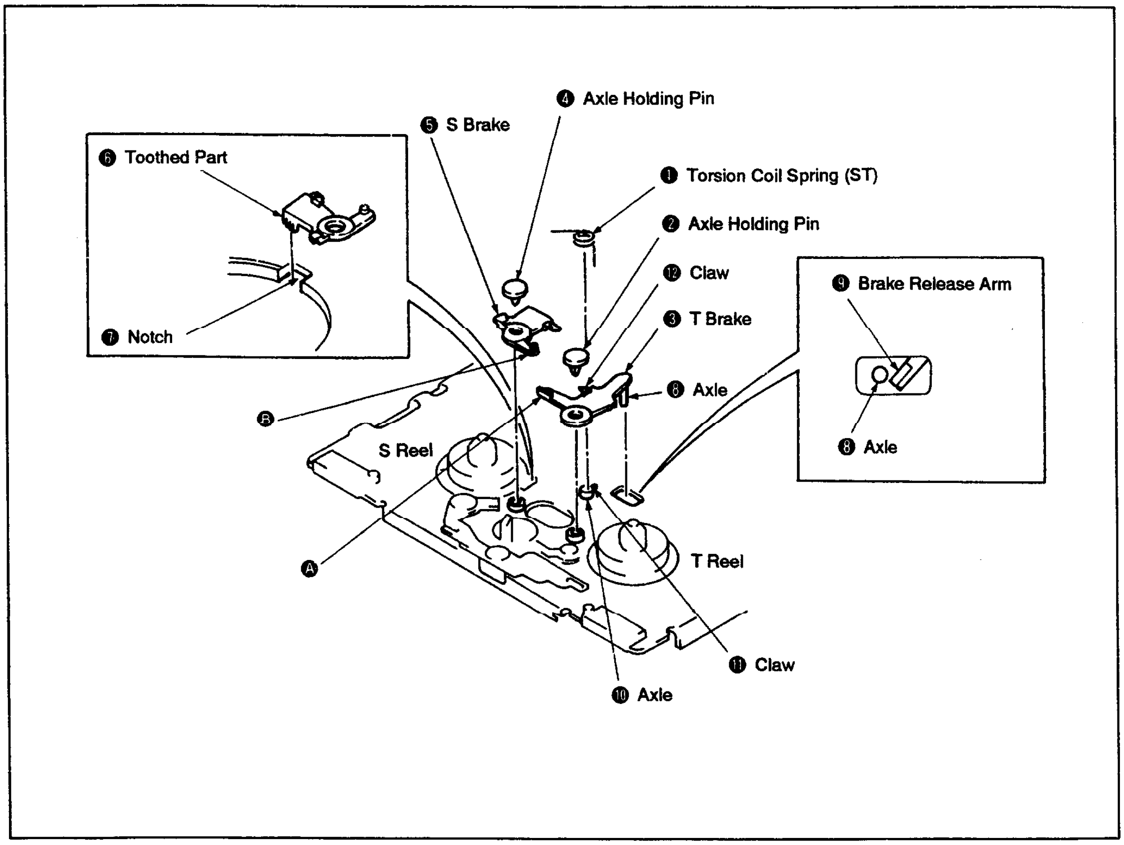

❹ Axle Holding Pin
❺ S Brake
❻ Toothed Part
❼ Notch
❶ Torsion Coil Spring (ST)
❷ Axle Holding Pin
⓬ Claw
❸ T Brake
❾ Brake Release Arm
❽ Axle
Ⓑ
❽ Axle
S Reel
Ⓐ
T Reel
⓫ Claw
❿ Axle

Fig. 3-4.

3-5. LB BRAKE, AXLE HOLDING PINS

1. Removal (See Fig. 3-5.)

1) Remove the screw ❶, then remove the TL holding plate ❷.
2) Remove the axle holding pin ❸, then remove the LB brake ❹.
3) Remove the axle holding pin ❺, then remove the LB lever ❻.

2. Installation (See Fig. 3-5.)

1) Mount the LB lever ❻ matching it to pin ❼ of the LB gear, then secure it with the axle holding pin ❺.
2) Insert the pin ❽ into the notch ❾ of the LB lever ❻, then mount the LB brake ❹ while inserting the toothed part ❿ into the notch ⓫.
3) Insert the axle holding pin ❸.
4) Align the dowel ⓬ with the hole ⓭, then mount the TL holding plate and secure it with the screw ❶.

Note: Confirm that the claws of axle holding pins ❸ and ❺ are not broken before assembling.

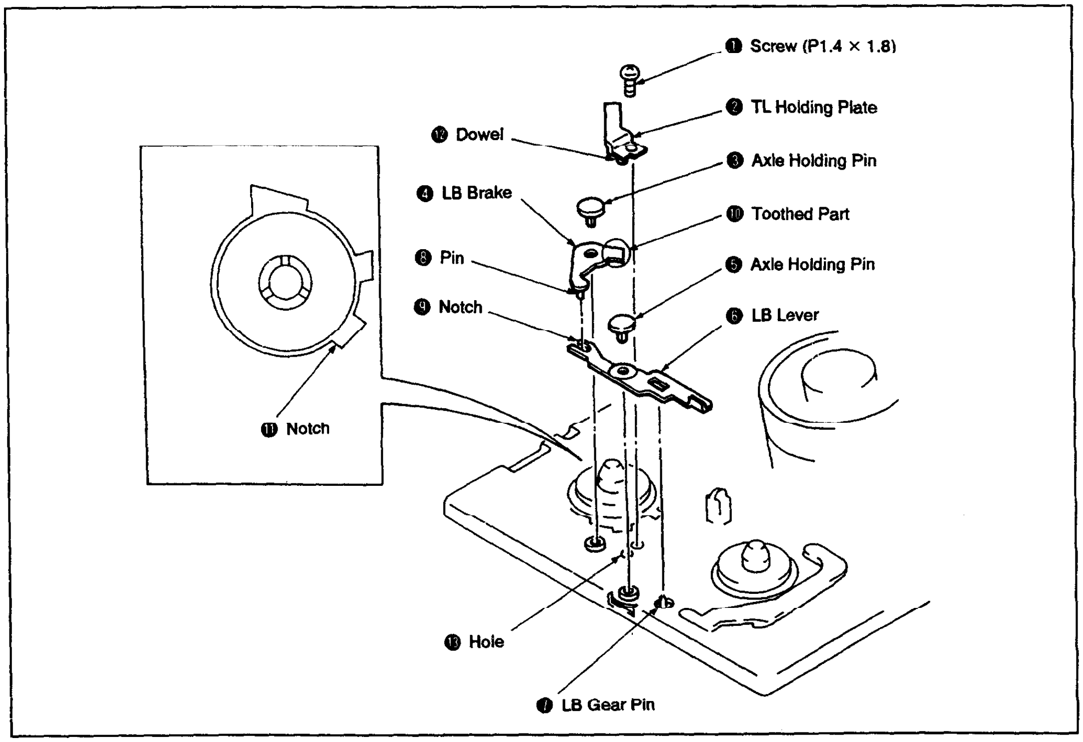

❶ Screw (P1.4 × 1.8)
❷ TL Holding Plate
⓬ Dowel
❸ Axle Holding Pin
❹ LB Brake
❿ Toothed Part
❽ Pin
❺ Axle Holding Pin
❾ Notch
❻ LB Lever
⓫ Notch
⓭ Hole
❼ LB Gear Pin

Fig. 3-5.

3-6. LB RELEASE ARM

1. Removal (See Fig. 3-6.)

1) While pushing the claw ❶ in the direction of the arrow, remove the LB release arm ❷.

2. Installation (See Fig. 3-6.)

1) Fit the LB release arm ❷ to the axle ❸, insert protrusions ⓐ, ⓑ, ⓒ, ⓓ into the three holes ❹, then secure with the claw ❶.

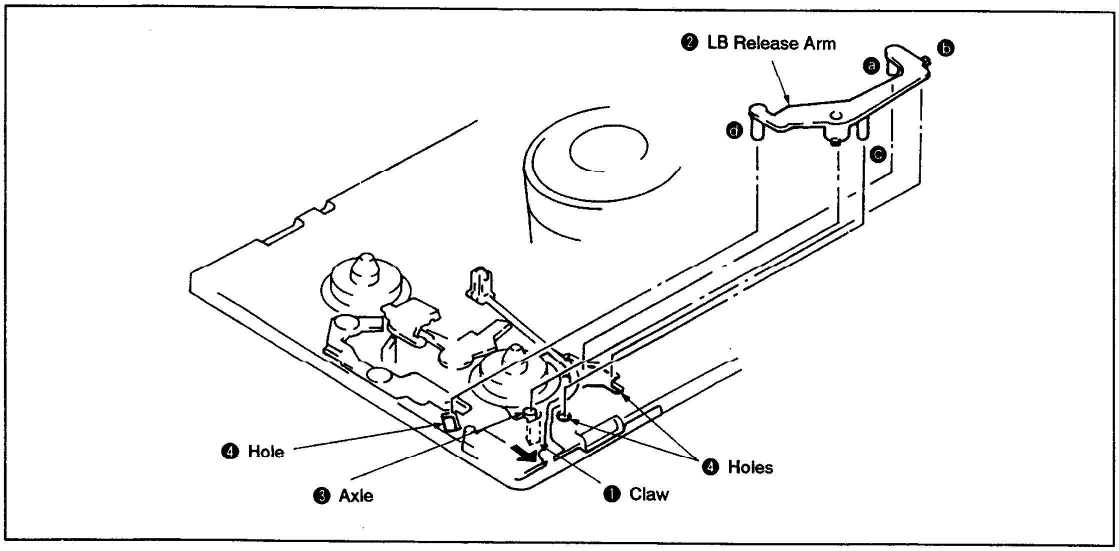

❷ LB Release Arm
ⓑ
ⓐ
ⓓ
ⓒ
❹ Hole
❸ Axle
❹ Holes
❶ Claw

Fig. 3-6.

3-7. RK STOPPER, RK STOPPER ARMS

1. Removal (See Fig, 3-7.)

1) Remove the torsion coil spring (RK) ❶.
2) Open the chassis claw ❷, then remove the RK stopper arm ❸.
3) Remove the RK stopper ❹.

2. Installation (See Fig. 3-7.)

1) Mount the RK stopper ❹ onto the axle ❺.
2) Mount the RK stopper arm ❸ onto the axle ❻, insert Pin ❿ into hole ⓫, then hook the claw ❷ of the chassis to the hole ❼.
3) Insert the torsion coil spring (RK) ❶ into the axle ❺, then hook it to claws ❽ and ❾.

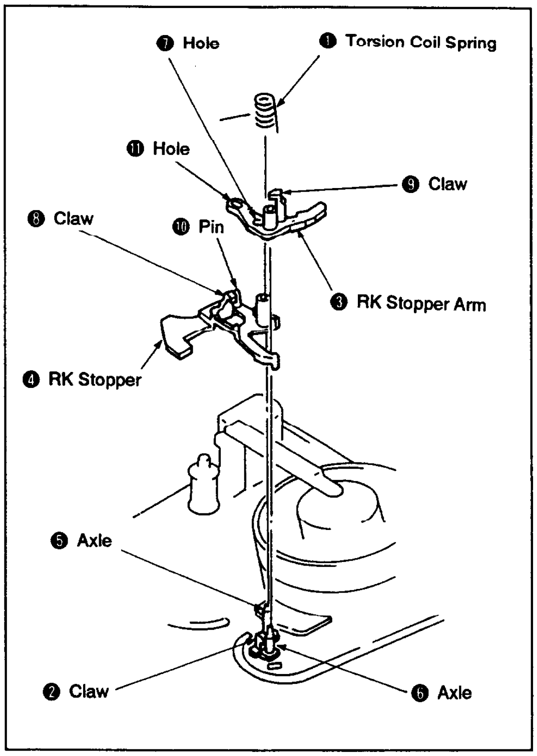

❼ Hole
❶ Torsion Coil Spring
⓫ Hole
❾ Claw
❽ Claw
❿ Pin
❸ RK Stopper Arm
❹ RK Stopper
❺ Axle
❷ Claw
❻ Axle

Fig. 3-7.

3-8. PINCH ARM ASSEMBLY, TG-7 ASSEMBLY

1. Removal (See Fig. 3-8.)

1) Set the $\boxed{\text{IB}}$ mode.
2) Remove the stopper washer ❶, then remove the pinch arm assembly ❷.
3) Bend the claw ❹ inside hole ❸ in the direction of the arrow using a thin screwdriver or the like, then remove the TG-7 plate spring ❺.
4) Remove the TG-7 arm assembly ❻.

2. Installation (See Fig. 3-8.)

1) Grease the inner surfaces of hole ❼ (See Fig. A).
2) Insert the axle ❽ of the TG-7 arm assembly ❻ into the hole ❼.
3) Grease the shaded section ⓐ (See Fig. A).
4) Insert the TG-7 plate spring ❺ into the hole ❸, then secure it with the claw ❹.
5) Apply half a drop of oil to the axle ❾ (See Fig. B).
6) Fit the pinch arm assembly ❷ to the axle ❾ and insert the pinch roller sub arm assembly tab ❿ into the ⓑ part.
7) Install the stopper washer ❶.

Note:
- Take care not to grease the screw ⓫ of the TG-7 arm assembly ❻ (See Fig. A).
- When fitting the pinch arm assembly ❷ to the axle ❾, make sure that it does not touch the TG-7 guide ⓬ or the rubber roller ⓭.
- After assembling, be sure to perform tape path adjustment as described in section 4.

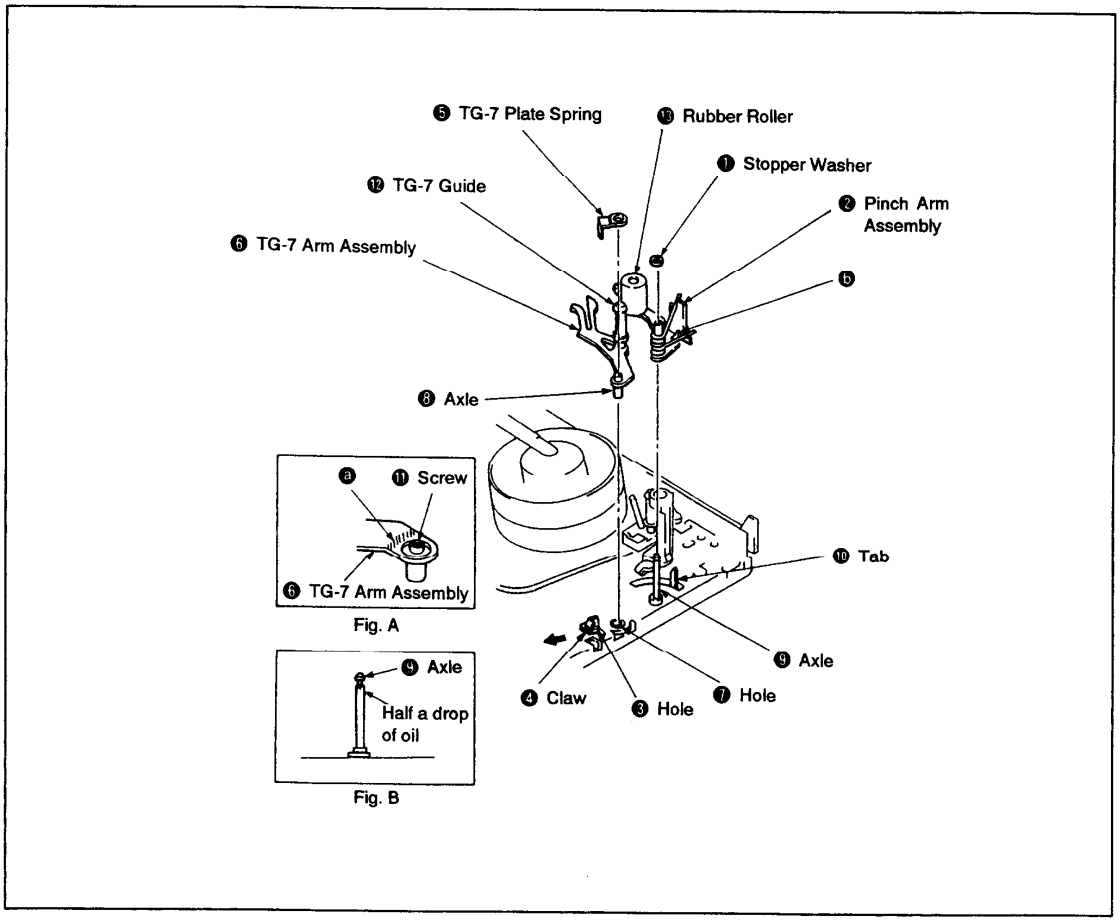

❺ TG-7 Plate Spring
⓭ Rubber Roller
❶ Stopper Washer
⓬ TG-7 Guide
❷ Pinch Arm Assembly
❻ TG-7 Arm Assembly
ⓑ
❽ Axle
ⓐ
⓫ Screw
❻ TG-7 Arm Assembly
Fig. A
❿ Tab
❾ Axle
Half a drop of oil
Fig. B
❾ Axle
❹ Claw
❸ Hole
❼ Hole

Fig. 3-8.

3-9. TG-2 ASSEMBLY

1. Removal (See Fig. 3-9.)

1) Remove the TG-2 upper flange assembly ❶.
2) Remove the TG-2 roller ❷, the TG-2 sleeve ❸, the TG-2 lower flange ❹ and the compression spring ❺.

2. Installation (See Fig. 3-9.)

1) Mount the compression spring ❺, the TG-2 lower flange ❹, the TG-2 sleeve ❸ and the TG-2 roller ❷ to the axle.
2) Secure the TG-2 upper flange ❶ to the axle by rotating it 4 to 6 turns.

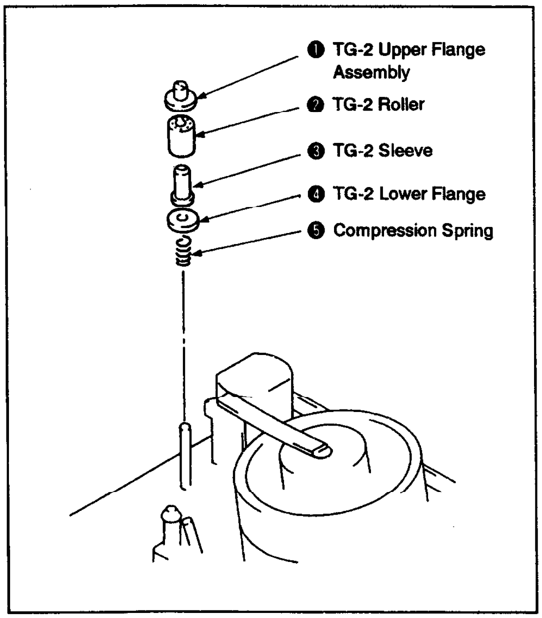

❶ TG-2 Upper Flange Assembly
❷ TG-2 Roller
❸ TG-2 Sleeve
❹ TG-2 Lower Flange
❺ Compression Spring

Fig. 3-9.

3. TG-2 Height Preset (see Fig. 3-10.)

1) Adjust height from the mechanism chassis upper surface to the TG-2 upper flange ❶ upper surface to 18.6 mm by turning the TG-2 upper flange ❶.

Note: After adjustment, be sure to perform tape path adjustment as described in section 4.

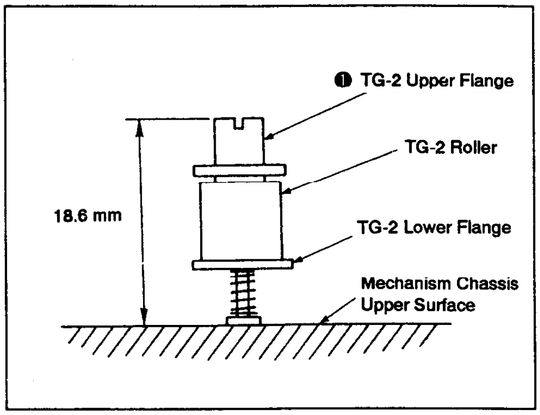

❶ TG-2 Upper Flange
TG-2 Roller
18.6 mm
TG-2 Lower Flange
Mechanism Chassis Upper Surface

Fig. 3-10.

3-10. S REEL TABLE ASSEMBLY, T REEL TABLE ASSEMBLY

1. Removal (See Fig. 3-11.)

1) Remove the S brake and T brake as described in section 3-4.
2) Remove the TL holding plate as described in section 3-5.
3) Remove the tension regulator band assembly as described in section 3-11.
4) Remove the S reel table assembly ❶.
5) Turn the stopper ❷ approx. 90 ° in the direction of the arrow Ⓐ.
6) While sliding the LB release arm ❸ in the direction of the arrow Ⓑ, remove the T reel table assembly ❹.

2. Installation (See Fig. 3-11.)

1) Apply half a drop of oil to the axle ❺ (See Fig. A).
2) Move the RK gear ❻ in the direction of the arrow Ⓒ and the TS brake ❼ in the direction of the arrow Ⓓ, putting them out of the way.
3) While sliding the LB release arm ❸ in the direction of the arrow Ⓑ, mount the T reel table assembly ❹ onto the axle ❺, then turn the stopper ❷ in the direction of the arrow Ⓔ as far as it will go.
4) Apply half a drop of oil to the axle ❽ (See Fig. B).
5) Move the RK gear ❻ in the direction of the arrow Ⓕ, the UL brake ❾ in the direction of the arrow Ⓖ and the LB brake ❿ in the direction of the arrow Ⓗ, putting them out of the way.
6) Mount the S reel table ❶ onto the axle ❽.
7) Mount the tension regulator band assembly as described in section 3-11.
8) Mount the TL holding plate as described in section 3-5.
9) Mount the S brake and T brake assemblies as described in section 3-4.

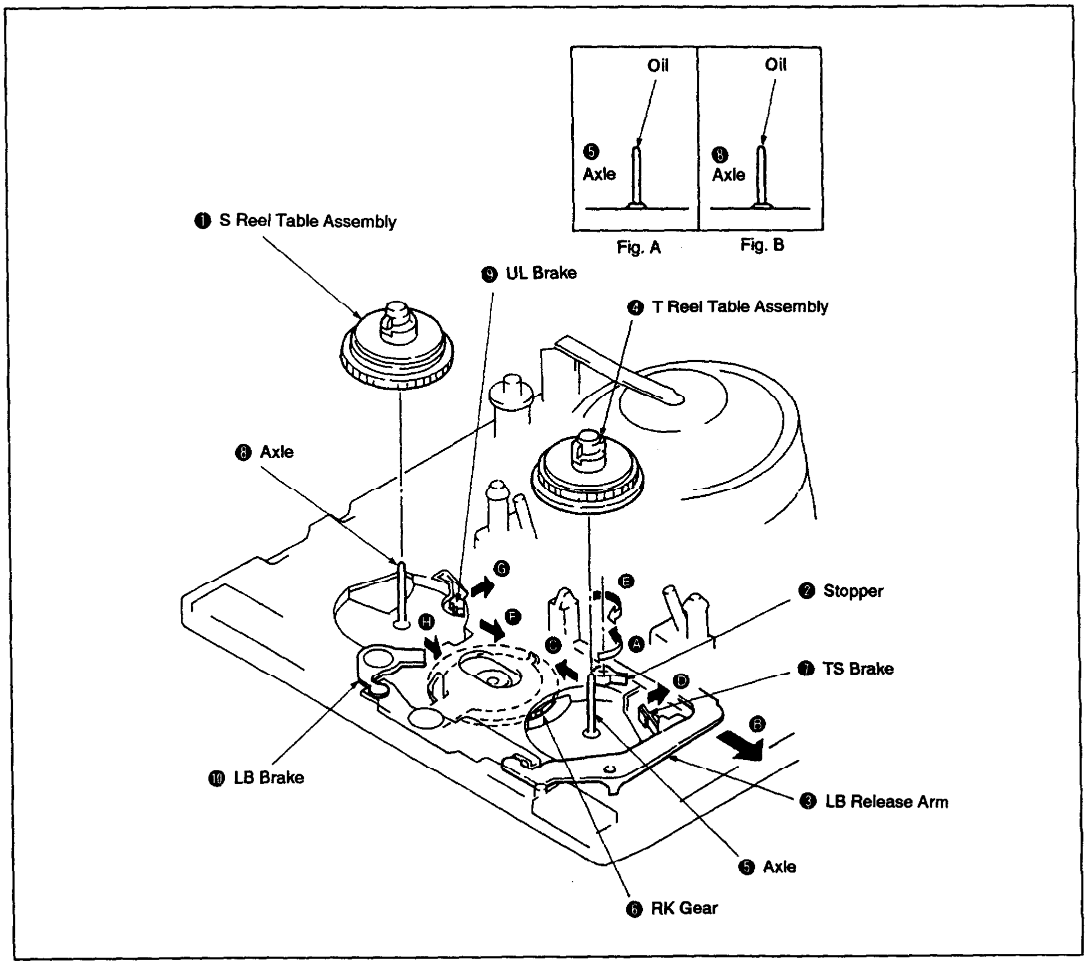

Oil
❺ Axle
Fig. A
Oil
❽ Axle
Fig. B
❶ S Reel Table Assembly
❾ UL Brake
❹ T Reel Table Assembly
❽ Axle
Ⓖ
Ⓕ
Ⓗ
Ⓒ
Ⓔ
Ⓐ
Ⓓ
Ⓑ
❷ Stopper
❼ TS Brake
❿ LB Brake
❸ LB Release Arm
❺ Axle
❻ RK Gear

Fig. 3-11.

3-11. TENSION REGULATOR BAND ASSEMBLY, TENSION REGULATOR ARM ASSEMBLY

1. Removal (See Fig. 3-12.)

1) Remove the TL holding plate as described in section 3-5.
2) Remove the screw ❶.
3) Using a thin screwdriver or the like, remove the tension regulator band assembly ❹ from the axle ❸ of tension regulator arm assembly ❷.
4) Remove the tension spring ❺.
5) Remove the stopper washer ❻ from the back of the mechanism chassis, then remove the tension regulator arm assembly ❷.
6) Open the claw ❼, then remove the adjust arm ❽.

Note: When removing the tension regulator band assembly ❹, take care not to twist or bend it, and not to touch the felt surface ❾.

2. Installation (See Fig. 3-12.)

1) Engage the adjust arm ❽ in the position shown in Fig. A, then close the claw ❼.
2) Apply half a drop of oil to the hole ❿.
3) Mount the tension regulator arm assembly ❷, then insert it into the slot ⓫ so that the ⓐ part comes to the arrow Ⓐ side of the switch lever assembly (See Fig. B).
4) While holding the tension regulator arm assembly ❷ from the mechanism chassis front, secure it with the stopper washer ❻ from the back.
5) Hook the R hook of the tension spring ❻ to the adjust arm ❽ as shown in the figure, then hook the opposite end to the tension regulator arm assembly ❷.
6) Mount the tension regulator band assembly ❹ onto the axle ❸ of tension regulator arm assembly ❷, and place it so that the felt surface ❾ comes against the shaded portion of the S reel table assembly ⓬.
7) Mount the tension regulator plate ⓭ of the tension regulator band assembly ❹ so that it is aligned with the dowel ⓮ of the mechanism chassis, then secure it temporarily with the screw ❶.
8) Mount the TL holding plate as described in section 3-5.
9) Adjust tension regulator FWD position as described in section 3-12.
10) Perform adjust arm adjustment as described in section 3-22.

Note: When mounting the tension regulator band assembly ❷, take care not to twist or bend it, and not to touch the felt surface ❾.

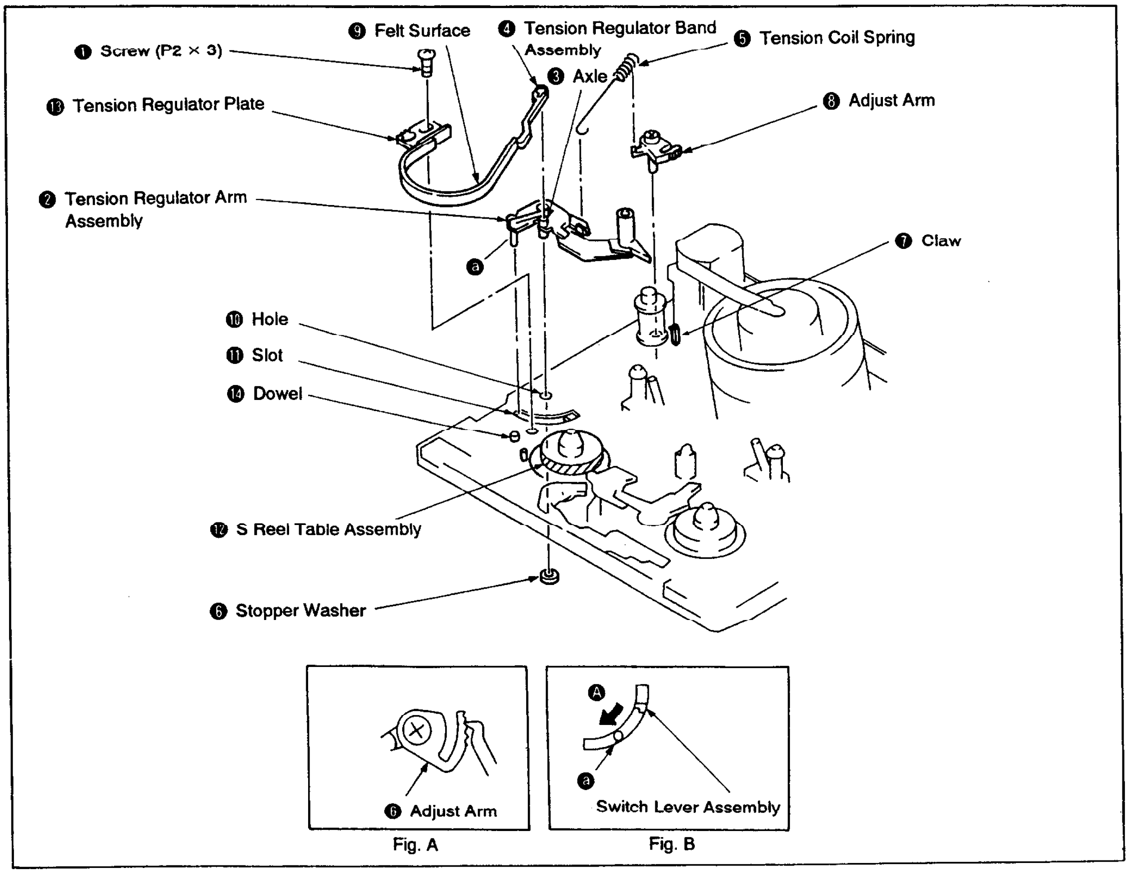

❶ Screw (P2 × 3)
❾ Felt Surface
❹ Tension Regulator Band Assembly
❺ Tension Coil Spring
❸ Axle
⓭ Tension Regulator Plate
❽ Adjust Arm
❷ Tension Regulator Arm Assembly
ⓐ
❼ Claw
❿ Hole
⓫ Slot
⓮ Dowel
⓬ S Reel Table Assembly
❻ Stopper Washer
❻ Adjust Arm
Ⓐ
ⓐ
Switch Lever Assembly

Fig. A

Fig. B

Fig. 3-12.

3-12. TENSION REGULATOR FWD POSITION PRESET (See Fig. 3-13.)

1) Load a cassette tape and set the FWD mode.
2) Confirm whether the distance between ⓐ part of the tension regulator arm ❶ and the groove ❷ of the chassis is 1.1 ± 0.3 mm. If this distance is not within the specified range, remove the cassette tape and perform the following adjustment.
3) Loosen the fixing screw ❹ of the tension regulator band assembly ❸.
4) Slide the tension regulator plate ❺ in the direction of the arrow Ⓐ if the measured distance is over the specified range, and in the direction of the arrow Ⓑ if it is under that range. Then, fix it with the screw ❹.
5) Repeat steps 1) and 2) and confirm that the distance is within the specified range.

Note: Use a cassette with the tape advanced halfway.

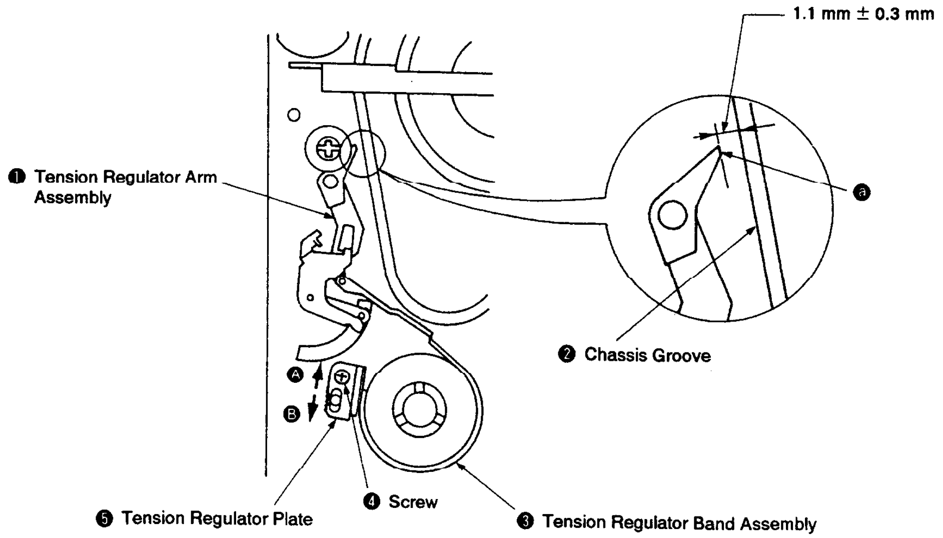

1.1 mm ± 0.3 mm
❶ Tension Regulator Arm Assembly
ⓐ
❷ Chassis Groove
Ⓐ
Ⓑ
❹ Screw
❺ Tension Regulator Plate
❸ Tension Regulator Band Assembly

Fig. 3-13.

3-13. DRUM ASSEMBLY, DEW SENSOR

1. Removal (See Fig. 3-14.)

1) Set the EJECT mode.
2) Remove the flexible board ❶ and the two connectors ❷.
3) Remove the guide guard assembly as described in section 3-2.
4) Remove the screw ❸, then remove the axle ground terminal ❹.
5) Remove the three screws ❺, then remove the drum assembly ❻ from the mechanism chassis.
6) Remove the connector ❿
7) Remove the screw ❼, then remove the dew sensor ❽.

Note:
- When removing the drum assembly ❻ from the mechanism chassis, take care not to cut the flexible board ❶ or the harness.
- Take care not to touch the head tip ❾.

2. Installation (See Fig. 3-14.)

1) Insert part ⓐ of the dew sensor ❽ into the notch ⓫ of the mechanism chassis, then secure it with the screw ❼.
2) Mount the connector ❿.
3) Clamp the harness ⓯ of the dew sensor ❽ with the reinforcing the claw ⓰ of the plate SS assembly (See Fig. A).
4) Insert the connector ❷ and the flexible board ❶ into the hole ⓬ of the mechanism chassis, align the drum assembly ❻ with the two dowels ⓭ and secure it with the three screws ❺.
5) Align the axle ground terminal ❷ with the two dowels ⓮ of the mechanism chassis and secure it with the screw ❸.
6) Mount the guide guard assembly as described in section 3-2.
7) Mount the two connectors ❷ and the flexible board ❶.

Note:
- Take care not to cut the flexible board ❶ or the harness ⓯.
- Take care not to touch the head tip ❾.
- After assembling, be sure to perform Tape Path Adjustment following instructions in section 4.

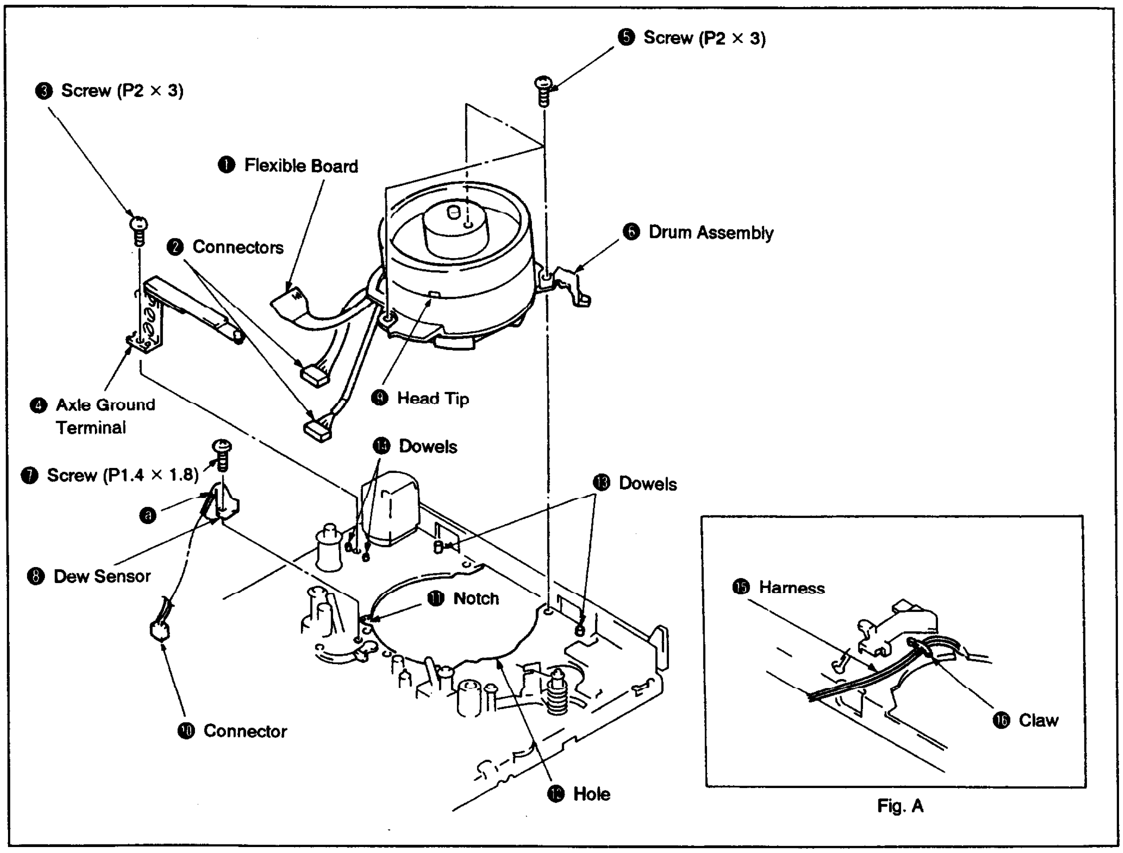

❺ Screw (P2 × 3)
❸ Screw (P2 × 3)
❶ Flexible Board
❷ Connectors
❻ Drum Assembly
❹ Axle Ground Terminal
❾ Head Tip
⓮ Dowels
❼ Screw (P1.4 × 1.8)
ⓐ
⓭ Dowels
❽ Dew Sensor
⓫ Notch
❿ Connector
⓬ Hole
⓯ Harness
⓰ Claw
Fig. A

Fig. 3-14.

3-14. EJECT LEVER, SWITCH LEVER ASSEMBLY, PINCH ROLLER SUB ARM ASSEMBLY

1. Removal (See Fig. 3-15.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Set the STOP mode.
3) Remove the claw ❶, then remove the eject lever ❷.
4) Remove the stopper washer ❸, then remove the switch lever assembly ❹.
5) Remove the pinch roller load spring ❺.
6) Remove the stopper washer ❻, then remove the pinch roller sub arm assembly ❼.

2. Installation (See Fig. 3-15.)

1) Grease the axle ❽ (See Fig. A).
2) Assemble by inserting 🅐 part of the pinch roller sub arm assembly ❼ into the slot ❾, then insert the pin ❿ into the loading lever assembly notch ⓫.
3) Secure with the stopper washer ❻.
4) Mount the pinch roller load spring ❺ by catching its 🅑 end between the claw ⓬ and the chassis side and its 🅒 end to the claw ⓬.
5) Apply half a drop of oil to the axle ⓭ (See Fig. B).
6) Align the groove ⓮ of the switch lever assembly ❹ with the mode detector switch protrusion ⓯, mount it on the axle ⓭, then insert the pin ⓰ into the drive gear (left) assembly ⓱ outer groove.
7) Secure with the stopper washer ❸.
8) Mount the eject lever ❷ and close the claw ❶.
9) Mount the DC motor (capstan motor) as described in section 3-3.

Note: When mounting the switch lever assembly ❹ onto the axle ⓭ with the tension regulator arm assembly installed, set the pin ⓰ to the arrow 🅐 side of the switch lever assembly ❹.

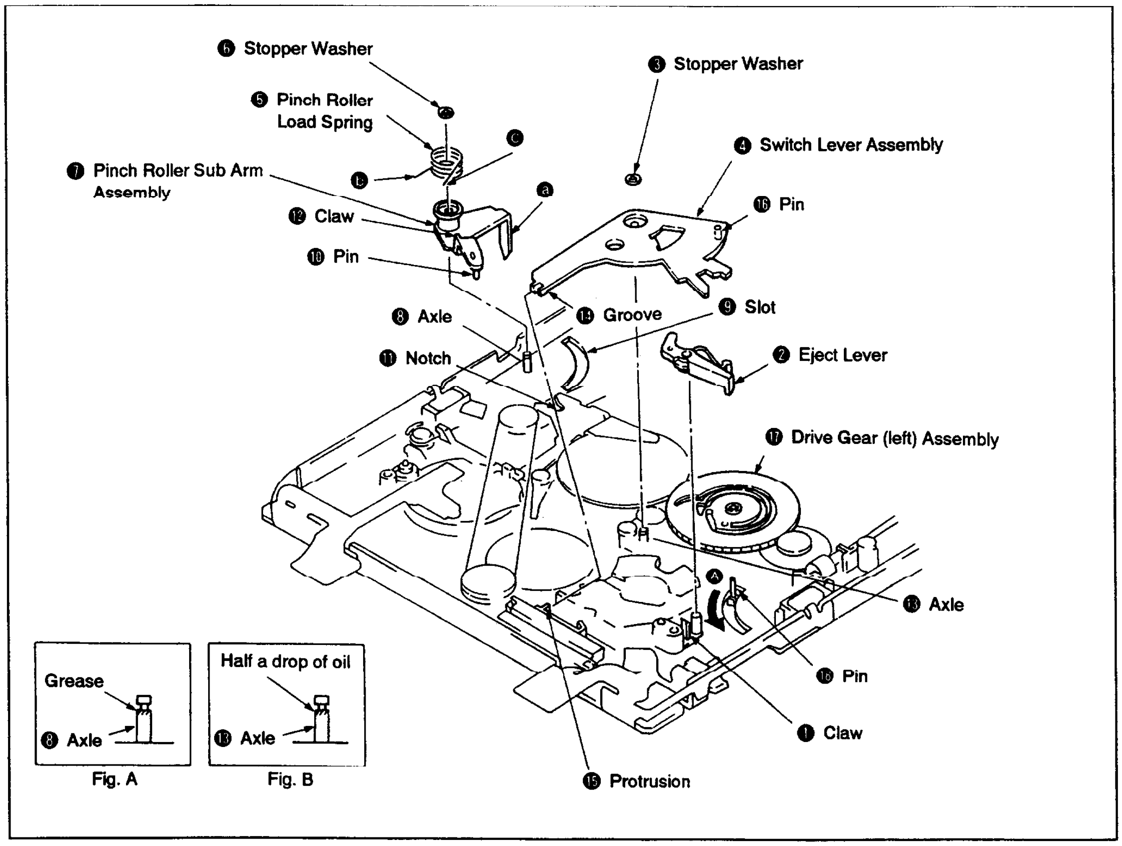

❻ Stopper Washer
❺ Pinch Roller Load Spring
🅒
❼ Pinch Roller Sub Arm Assembly
🅑
🅐
⓬ Claw
❿ Pin
❽ Axle
⓫ Notch
❸ Stopper Washer
❹ Switch Lever Assembly
⓰ Pin
⓮ Groove
❾ Slot
❷ Eject Lever
⓱ Drive Gear (left) Assembly
🅐
⓭ Axle
⓰ Pin
❶ Claw
⓯ Protrusion
Grease
❽ Axle
Fig. A
Half a drop of oil
⓭ Axle
Fig. B

Fig. 3-15.

3-15. TIMING BELT (L) , RC GEAR ASSEMBLY, LOADING LEVER ASSEMBLY, TIMING BELT (S), CONNECTING GEAR ASSEMBLY

1. Removal (See Fig. 3-16.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the pinch roller sub arm assembly as described in section 3-14.
3) Set the STOP mode.
4) Remove the stopper washer ❶ , then remove the RC gear assembly ❷ from the axle ❹ with the timing belt (L) ❸ attached.
5) Remove the timing belt (L) ❸ from the idler pulley assembly ❺ .
6) Remove the stopper washer ❻ and remove the loading lever assembly ❽ while pushing the claw ❼ in the direction of the arrow Ⓐ .
7) Turn the stopper ❾ approx. 90 ° in the direction of the arrow Ⓑ .
8) Remove the connecting gear assembly ⓫ from the axle ⓰ with the timing belt (S) ❿ attached.
9) Remove the timing belt (S) ❿ from the idler pulley assembly ❺ .

Note: When removing the connecting gear ⓫ , take care not touch the flange section ⓑ .

2. Installation (See Fig. 3-16.)

1) Apply half a drop of oil to the axle ⓰ (See Fig. F).
2) Hook one end of the timing belt (S) ❿ onto the connecting gear assembly ⓫ and the other end onto gear ⓓ of the idler pulley assembly ❺ . (Refer to the figure.)
3) Mount the connecting gear assembly ⓫ with the timing belt (S) ❿ attached to the axle ⓰ .
4) Turn the stopper ❾ in the direction of the arrow Ⓒ as far as it will go.
5) Apply half a drop of oil to the axle ⓬ (See Fig. A).
6) Fit the loading lever assembly ❽ to the axle ⓬ , secure the ⓐ part with the claw ❼ and place the pin ⓭ into the groove of the drive gear (right) assembly ⓮ .
7) Install the stopper washer ❻ .
8) Place the timing belt (L) ❸ around the gears of the RC gear assembly ❷ indicated in Fig. B, and its opposite side around the gear ⓒ of the idler pulley assembly ❺ . (See Fig. E.)
9) Mount the RC gear assembly ❷ onto the axle ❹ with the timing belt (L) ❸ attached, and engage it with the gear of the RK gear assembly ⓯ .
10) Install the stopper washer ❶ .
11) Grease parts of the loading lever assembly ❽ indicated in Fig. C.
12) Mount the pinch roller sub arm assembly as described in section 3-14.
13) Mount the DC motor (capstan motor) as described in section 3-3.

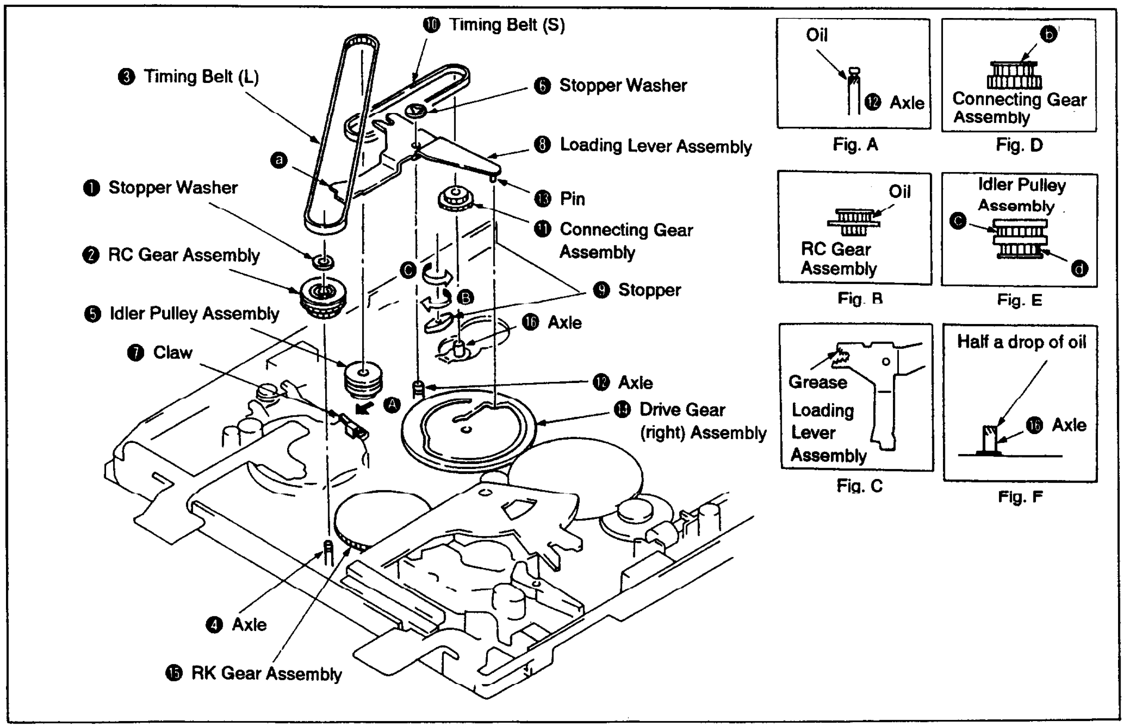

❿ Timing Belt (S)
❸ Timing Belt (L)
❻ Stopper Washer
❽ Loading Lever Assembly
ⓐ
❶ Stopper Washer
⓭ Pin
⓫ Connecting Gear Assembly
❷ RC Gear Assembly
Ⓒ
Ⓑ
❾ Stopper
❺ Idler Pulley Assembly
⓰ Axle
❼ Claw
⓬ Axle
Ⓐ
⓮ Drive Gear (right) Assembly
❹ Axle
⓯ RK Gear Assembly
Oil
⓬ Axle
ⓑ
Connecting Gear Assembly
Oil
RC Gear Assembly
Idler Pulley Assembly
ⓒ
ⓓ
Grease
Loading Lever Assembly
Half a drop of oil
⓰ Axle

Fig. A

Fig. D

Fig. B

Fig. E

Fig. C

Fig. F

Fig. 3-16.

3-16. IDLER PULLEY, TS BRAKE ASSEMBLY, LB GEAR ASSEMBLY, RK GEAR ASSEMBLY

1. Removal (See Fig. 3-17.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the switch lever assembly as described in section 3-14.
3) Remove the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly described in section 3-15.
4) Set the STOP mode.
5) Remove the stopper washer ❶, then remove the idler pulley ❷.
6) Open the claw ❸, then remove the TS brake assembly ❹.
7) Remove the torsion coil spring (LB) ❺.
8) Remove the stopper washer ❻, then remove the LB gear assembly ❼.
9) Remove the RK gear assembly ❽.

Note: When removing the idler pulley ❷, take care not to touch the flange section ⓐ. (See Fig. C.)

2. Installation (See Fig. 3-17.)

1) Apply half a drop of oil to the axle ❾ (See Fig. A).
2) Mount the RK gear assembly ❽ onto the axle ❾, keeping it in horizontal position.
3) Apply half a drop of oil to the axle ❿ (See Fig. B).
4) Mount the LB gear assembly ❼ onto the axle ❿ and secure it with the stopper washer ❻.
5) Insert the torsion coil spring (LB) ❺ into the axle ⓫, then hook it to the mechanism chassis notch ⓬ and to the tab ⓭.
6) Mount the TS brake assembly ❹ and close the claw ❸.
7) Apply half a drop of oil to the axle ⓮ (See Fig. D).
8) Mount the idler pulley ❷ onto the axle ⓮, then secure it with the stopper washer ❶.
9) Mount the timing belt (L), the RC gear assembly, the loading lever assembly, the timing belt (S) and the connecting gear assembly as described in section 3-15.
10) Mount the switch lever assembly as described in section 3-14.
11) Mount the DC motor (capstan motor) as described in section 3-3.

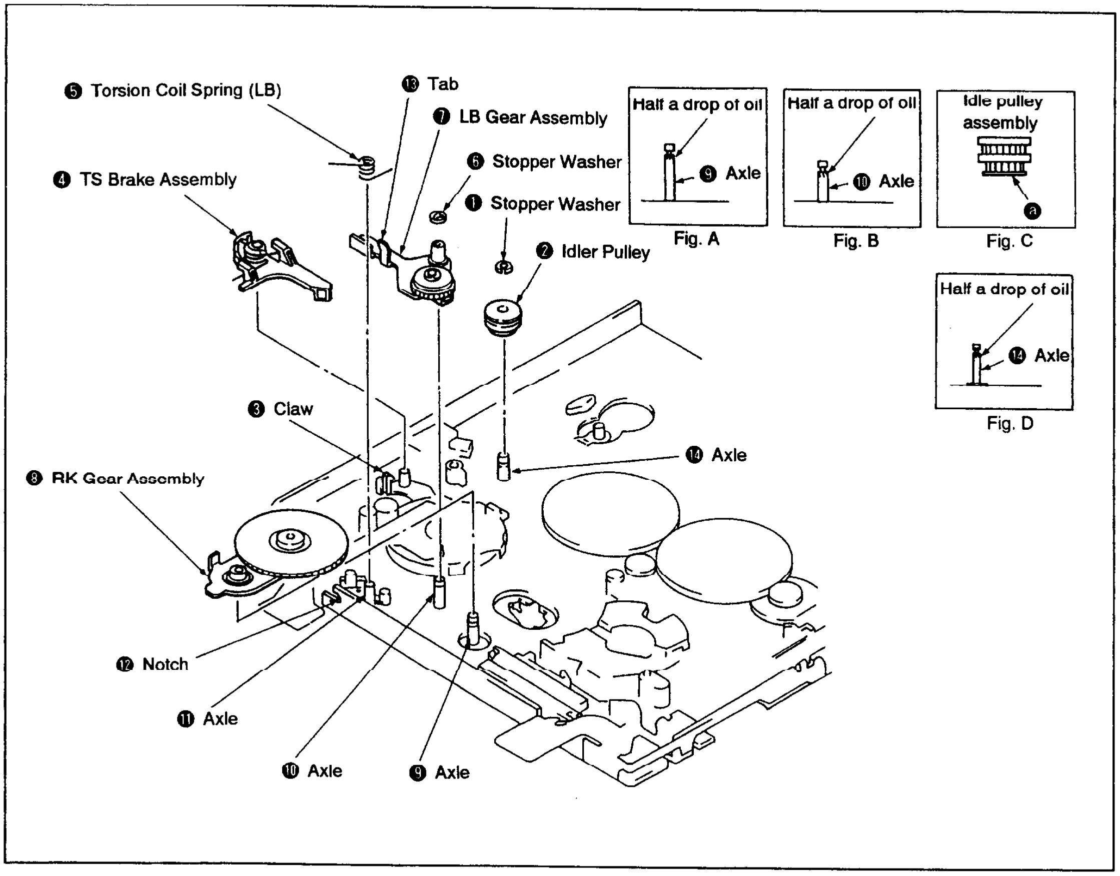

❺ Torsion Coil Spring (LB)
⓭ Tab
❼ LB Gear Assembly
❻ Stopper Washer
❹ TS Brake Assembly
❶ Stopper Washer
❷ Idler Pulley
❸ Claw
⓮ Axle
❽ RK Gear Assembly
⓬ Notch
⓫ Axle
❿ Axle
❾ Axle
Half a drop of oil
❾ Axle
Fig. A
Half a drop of oil
❿ Axle
Fig. B
Idle pulley assembly
ⓐ
Fig. C
Half a drop of oil
⓮ Axle
Fig. D

Fig. 3-17.

3-17. UL GEAR, UL BRAKE, UL ARM, LB PLATE SPRING

1. Removal (See Fig. 3-18.)

1) Remove the switch lever assembly as described in section 3-14.
2) Remove the stopper washer ❶, then remove the UL gear ❷.
3) Remove the UL arm ❸, the 1.6 mm-diameter poly washer ❹ and the LB plate spring ❺.
4) Remove the UL brake ❻.

2. Installation (See Fig. 3-18.)

1) Mount the UL brake ❻.
2) Apply half a drop of oil to the axle ❼ (See Fig. A).
3) Mount the LB plate spring ❺ to the axle ❼ as shown in Fig. B, then install the 1.6mm-diameter poly washer ❹.
4) Mount the UL arm ❸ to the axle ❼ so that the protrusion ❽ comes into the groove ❾ of the UL brake ❻.
5) Mount the UL gear ❷ to the axle ❼ and engage it with the gear of the drive gear (left) assembly ❿.
6) Install the stopper washer ❶.
7) Mount the switch lever assembly as described in section 3-14.

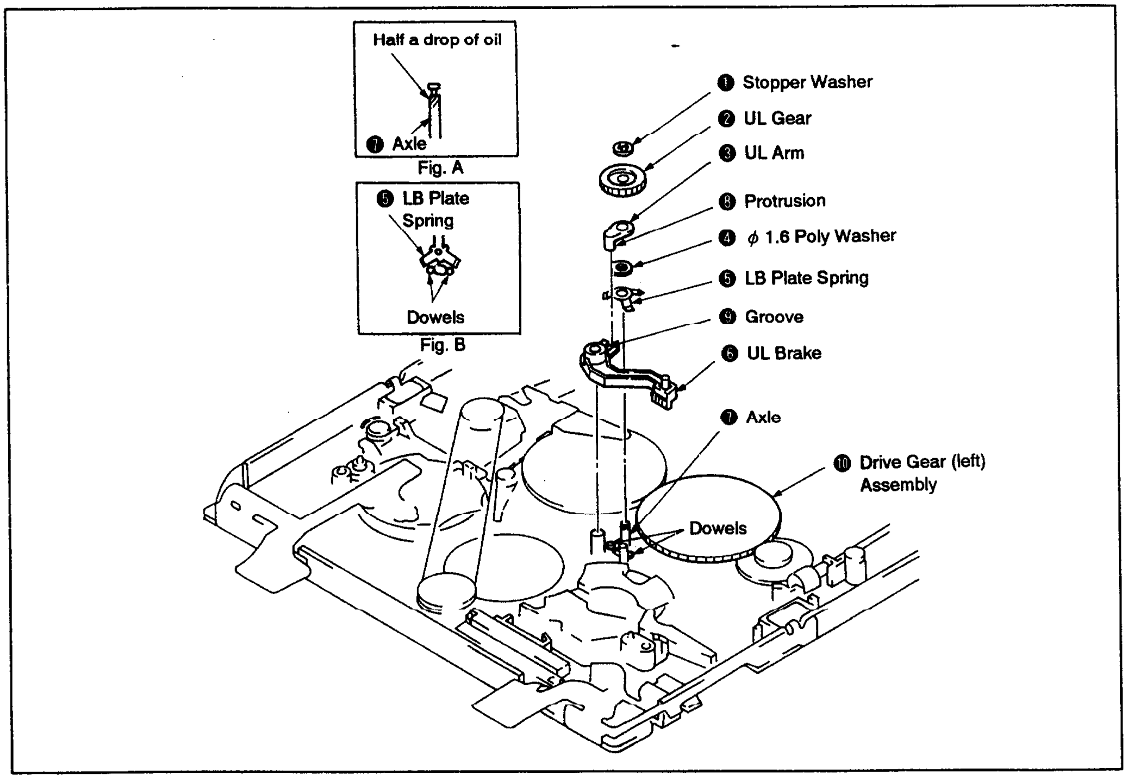

Half a drop of oil
❼ Axle
Fig. A
❺ LB Plate Spring
Dowels
Fig. B
❶ Stopper Washer
❷ UL Gear
❸ UL Arm
❽ Protrusion
❹ ϕ 1.6 Poly Washer
❺ LB Plate Spring
❾ Groove
❻ UL Brake
❼ Axle
❿ Drive Gear (left) Assembly
Dowels

Fig. 3-18.

3-18. COASTER (RIGHT) ASSEMBLY, DRIVE GEAR (RIGHT) ASSEMBLY

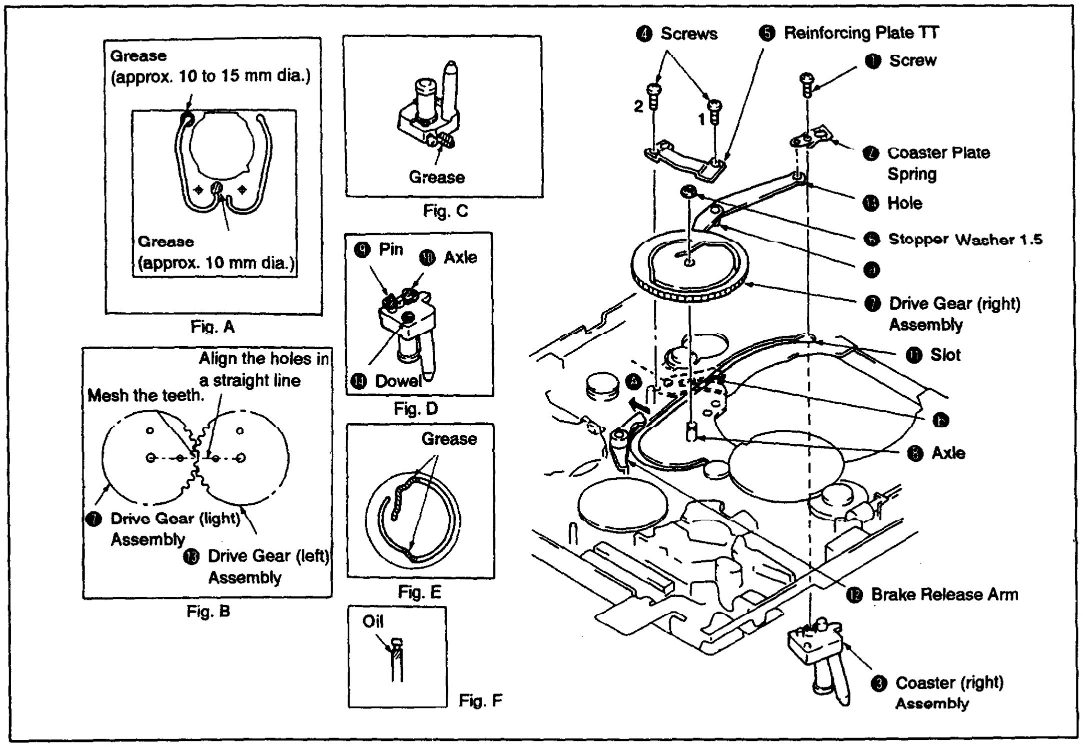
1. Removal (See Fig. 3-19.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the drum unit as described in section 3-13.
3) Remove the switch lever assembly as described in section 3-14.
4) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
5) Set the STOP mode.
6) Remove the screw ❶, then remove the coaster plate spring ❷ and the coaster (right) assembly ❸.
7) Remove the two screws ❹, then remove the reinforcing plate TT ❺.
8) Remove the stopper washer 1.5 ❻, then remove the drive gear (right) assembly ❼.

2. Installation (See Fig. 3-19.)

1) Grease the points of the mechanism chassis shown in Fig A.
2) Apply half a drop of oil to the axle ❽ (See Fig. F).
3) Grease pin ❾, axle ❿ and dowel ⓯ of the coaster (right) assembly ❸ (See Fig. D).
4) Mount by aligning the pin ❾ and the axle ❿ with the slot ⓫ of the mechanism chassis.
5) Move the brake release arm ⓬ in the direction of the arrow Ⓐ to put it out of the way.
6) Mount the drive gear (right) assembly ❼ to the axle ❽, and engage it with the drive gear (left) assembly ⓭ as shown in Fig. B.
7) Align the ⓐ part with the ⓑ part, and the hole ⓮ with the pin ❾ of the coaster (right) assembly ❸.
8) Install the stopper washer 1.5 ❻.
9) Mount by aligning the coaster plate spring ❷ with the axle ❿ of the coaster (right) assembly ❸ and pin ❾, then secure with the screw ❶.
10) Mount the reinforcing plate TT ❺ aligning it with the dowel ⓯, then tighten the two screws ❹ in the indicated order.
11) Grease the points indicated in Figs. C and E.
12) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
13) Mount the switch lever assembly as described in section 3-14.
14) Mount the drum unit as described in section 3-13.
15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:
- Screw ❶ should be tightened with a tightening torque of approx. 500g•cm. If tightened too much, the coaster (right) assembly ❸ and the coaster plate spring ❷ will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.



Grease
(approx. 10 to 15 mm dia.)
Grease
(approx. 10 mm dia.)
Fig. A
Align the holes in a straight line
Mesh the teeth.
❼ Drive Gear (right) Assembly
⓭ Drive Gear (left) Assembly
Fig. B
Grease
Fig. C
❾ Pin
❿ Axle
⓯ Dowel
Fig. D
Grease
Fig. E
Oil
Fig. F
❹ Screws
❺ Reinforcing Plate TT
❶ Screw
2
1
❷ Coaster Plate Spring
⓮ Hole
❻ Stopper Washer 1.5
ⓐ
❼ Drive Gear (right) Assembly
⓫ Slot
Ⓐ
ⓑ
❽ Axle
⓬ Brake Release Arm
❸ Coaster (right) Assembly

Fig. 3-19.

3-19. COASTER (LEFT) ASSEMBLY, DRIVE GEAR (LEFT) ASSEMBLY

1. Removal (See Fig. 3-20.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the drum assembly as described in section 3-13.
3) Remove the switch lever assembly and the pinch roller sub-arm assembly as described in section 3-14.
4) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
5) Remove the coaster (right) assembly and the drive gear (right)assembly as described in section 3-18.
6) Remove the screw ❶, then remove the coaster plate spring ❷ and the coaster (left) assembly ❸.
7) Remove the two screws ❹, then remove the reinforcing plate SS assembly ❺.
8) Remove the stopper washer 1.5 ❻, then remove the drive gear (left) assembly ❼.

2. Installation (See Fig. 3-20.)

1) Grease the points of the mechanism chassis shown in Fig A.
2) Apply half a drop of oil to the axle ❽ (See Fig. E).
3) Grease pin ❾, axle ❿ and dowel ⓯ of the coaster (left) assembly ❸ (See Fig. B).
4) Mount by aligning the pin ❾ and the axle ❿ with the slot ⓫ of the mechanism chassis.
5) Fit the drive gear (left) assembly ❼ to the axle ❽, and mount so that the gear engages with the wheel gear ⓬ and the UL gear ⓭.
6) Align the ⓐ part with the slot ⓫, and the hole ⓮ with the pin ❾ of the coaster (left) assembly ❸.
7) Install the stopper washer 1.5 ❻.
8) Mount by aligning the coaster plate spring ❷ with the axle ❿ and pin ❾ of the coaster (left) assembly ❸, then secure with the screw ❶.
9) Mount the reinforcing plate SS assembly ❺ aligning it with the dowel ⓯, then tighten the two screws ❹ in the indicated order.
10) Grease points indicated in Figs. C and D.
11) Mount the coaster (right) assembly and the drive gear (right)assembly as described in section 3-18.
12) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
13) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
14) Mount the drum assembly as described in section 3-13.
15) Mount the DC motor (capstan motor) as described in section 3-3.

Note:
- Screw ❶ should be tightened with a tightening torque of approx. 500g•cm. If tightened too much, the coaster (right) assembly ❸ and the coaster plate spring ❷ will be deformed.
- After installing, be sure to perform tape path adjustment as described in section 4.

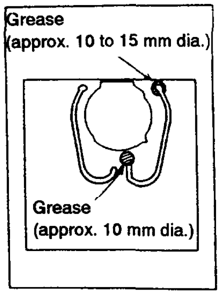

Grease
(approx. 10 to 15 mm dia.)
Grease
(approx. 10 mm dia.)

Fig. A

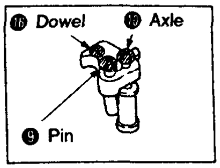

⓯ Dowel
❿ Axle
❾ Pin

Fig. B

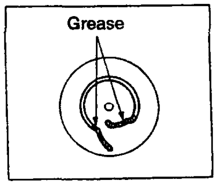


Fig. C

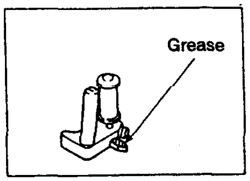


Fig. D

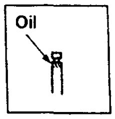


Fig. E

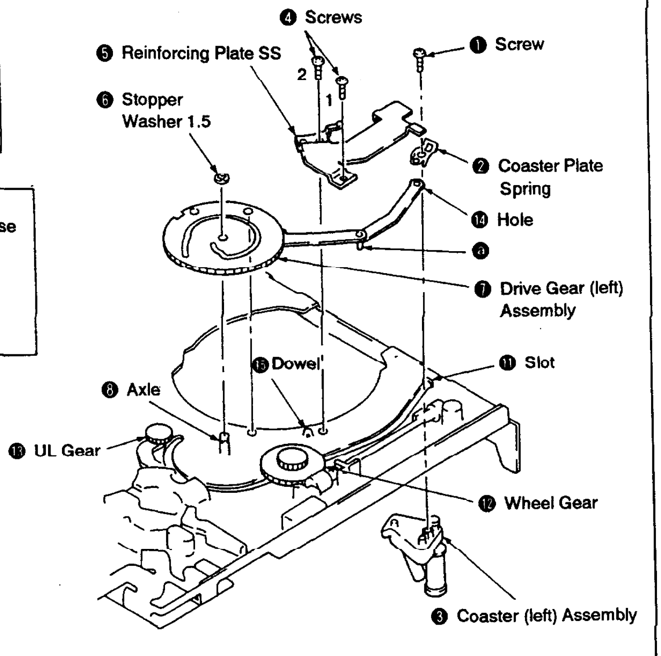

❹ Screws
❺ Reinforcing Plate SS
2
1
❶ Screw
❻ Stopper Washer 1.5
❷ Coaster Plate Spring
⓮ Hole
ⓐ
❼ Drive Gear (left) Assembly
⓯ Dowel
⓫ Slot
❽ Axle
⓭ UL Gear
⓬ Wheel Gear
❸ Coaster (left) Assembly

Fig. 3-20.

3-20. LOADING MOTOR, BRAKE RELEASE ARM, WHEEL GEAR, WORM ASSEMBLY

1. Removal (See Fig. 3-21.)

1) Remove the DC motor (capstan motor) as described in section 3-3.
2) Remove the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
3) Remove the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
4) Remove the drive gear (right) assembly as described in section 3-18.
5) Remove the drive gear (left) assembly as described in section 3-19.
6) Remove the two screws ❶, then remove the loading motor assembly ❷.
7) Remove the brake release arm ❸.
8) Remove the stopper washer ❹, then remove the wheel gear ❺.
9) Remove the worm assembly ❻ from the six claws ❼.

2. Installation (See Fig. 3-21.)

1) Mount the worm assembly ❻, matching it to the six claws ❼.
2) Grease the shaded parts of the worm assembly ❻ (five places) (see Fig A).
3) Apply half a drop of oil to the axle ❽ (See Fig. B).
4) Fit the wheel gear ❺ to the axle ❽ and engage it with the gear of the worm assembly ❻.
5) Mount the brake release arm ❸.
6) Grease the whole perimeter of the gear of the loading motor assembly ❷.
7) Align the loading motor assembly ❷ with the mechanism chassis and secure it with the two screws ❷.
8) Mount the drive gear (left) assembly as described in section 3-19.
9) Mount the drive gear (right) assembly as described in section 3-18.
10) Mount the timing belt (L), the RC gear assembly and the loading lever assembly as described in section 3-15.
11) Mount the switch lever assembly and the pinch roller sub arm assembly as described in section 3-14.
12) Mount the DC motor (capstan motor) as described in section 3-3.

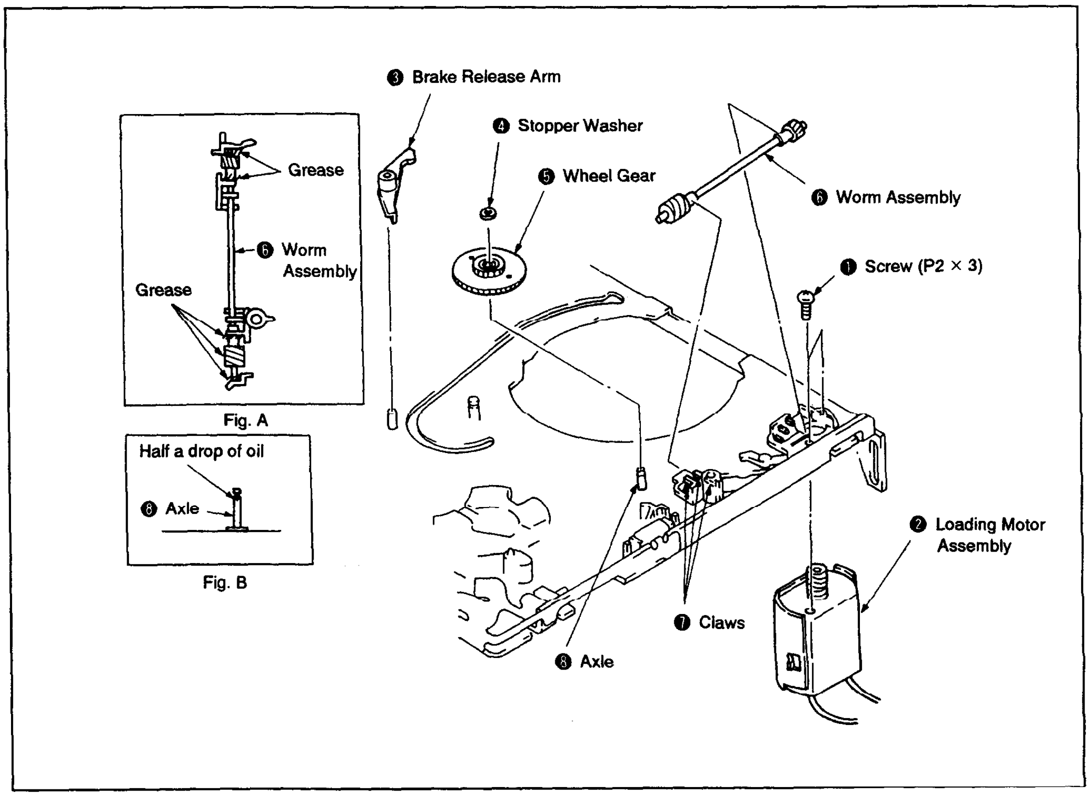


Fig. A

Fig. B

Fig. 3-21.

3-21. ROTARY UPPER DRUM REPLACEMENT

1. Removal

- If possible, make a recording before removal.

1) Detach the six solderings ⓐ, then use a pair of tweezers or the like to confirm that the terminals passing through the board holes from below can move freely.
2) Remove the two screws ❶ (See Fig. 3-22).
3) Mount the jig ❹ (Ref. No. J-7) with the two supplied screws ❷, then screw the attached hexagon socket screws ❸ to the jig ❹. The rotary upper drum ❺ will move upward and come off (See Fig. 3-23).

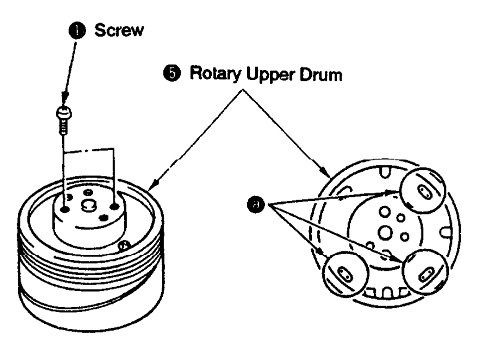


Fig. 3-22.

2. Installation

1) Wipe clean the flange surface and the rotary upper drum ❺ surface that makes contact with it, and confirm that they are free from dirt and scratches.
2) Insert the jig ❼ (Ref. No. J-7) into the drum positioning hole, then set the rotary upper drum ❺ by passing the jig through its positioning hole ❻.
   Note: Confirm that the terminals ❽ protrude slightly from the rotary upper drum board holes (See Fig. 3-24).
3) Remove the jig ❼ and push down the rotary upper drum ❺ gently by hand. If it does not go all the way down, secure it temporarily by tightening the two hexagon socket screws ❶ alternately.
4) Insert the jig ❼ into the positioning hole ❻ again and confirm that it goes in smoothly. If it does not, loosen the two screws ❶, repeat step 3 of the Removal paragraph and restart the setting procedure.
5) Tighten the screws ❶.
6) Solder the terminals ❽ (ⓐ in Fig. 3-22).
   Note: Take care that no solder flows below the board.

Note: After installing, be sure to perform tape path adjustment as described in section 4.

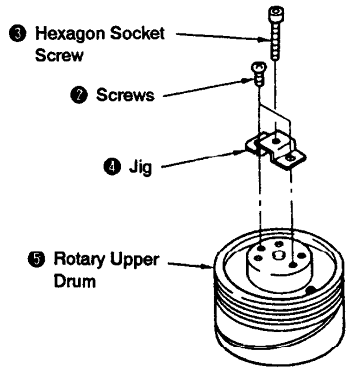


Fig. 3-23.

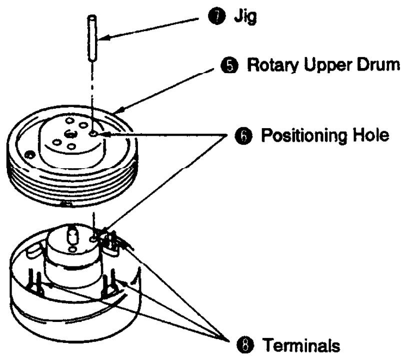


Fig. 3-24.

3-22. FWD BACK TENSION (See Fig. 3-25.)

1) Set the torque cassette (Ref. No. J-6).
2) Set the FWD mode and confirm that S reel table torque value is within 9 to 13 g•cm.
3) If the torque value does not meet the specification, adjust the adjust arm ❶.

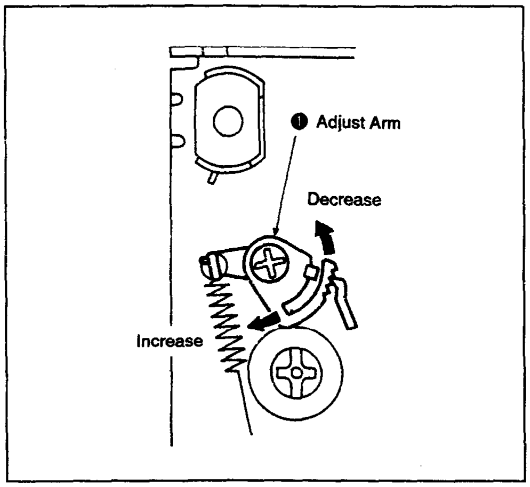


Fig. 3-25.

3-23. REEL TORQUE CHECK

1) Set the torque cassette.
2) Set the FWD mode and confirm that T reel table torque value is within 7 to 15 g•cm.
3) Set the REV mode and confirm that S reel table torque value is within 29 ± 6 g•cm.
4) Set the REV mode and confirm that T reel table torque value is within 13 to 25 g•cm.
5) If a torque value does not meet the specifications above, replace the corresponding reel table.

4. TAPE PATH ADJUSTMENT

[The Track Shift Mode]

In the 8 mm video system, instantaneous tape speed control is performed using four kinds of pilot signals, and high-precision tracking is achieved through the ATF (Automatic Track Finding) system. This makes a tracking control knob unnecessary and allows for precise tracing.

On the other hand, however, tape path adjustment presents some difficulties when the ATF system is used. Namely, since the ATF system will automatically compensate to some degree for head tracing errors, thorough adjustment is not possible.

This can be solved by setting the track shift mode for tracking fine adjustment. ATF will be compulsorily activated, shifting the tracking amount by a fixed amount (approx. 1/4) and thus making tracking fine adjustment easy. Furthermore, no track shift jigs are required.

4-1. TRACK SHIFT MODE SETTING

[Setting Procedure]

- Connect the TEST A and TEST B terminals to the COM terminal.
  Example:
  NTSC ········ GV-8
  PAL ·········· GV-8E
  Connect Pins ① and pin ③ of CN017 on the { SV-34 board (GV-8) / SV-35 board (GV-8E) } to pin ② of it. (See Fig. 4-1)

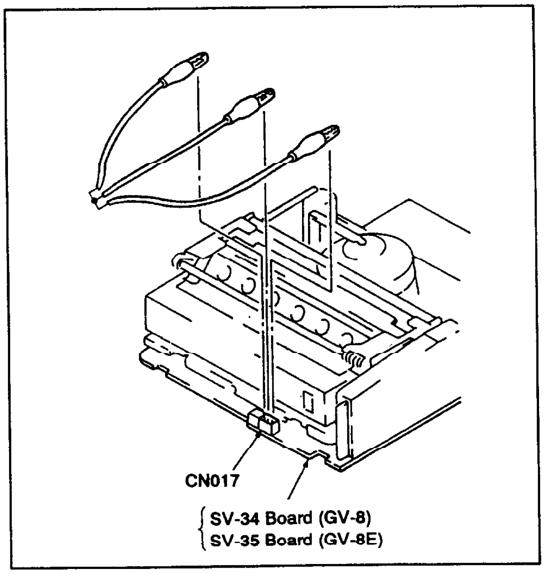
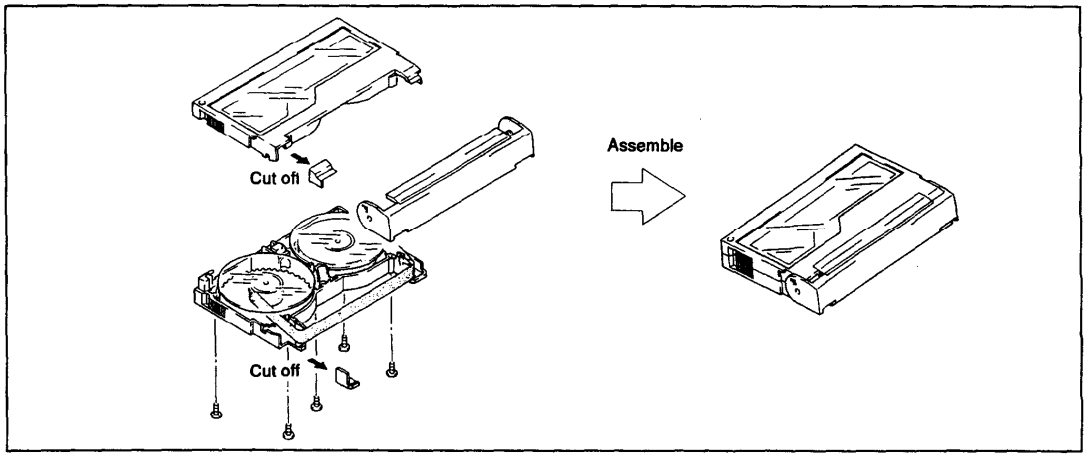


Fig. 4-1.

[Note on Adjustment of No.7 Guide (TG-7)]

The height adjustment screw for No.7 guide (TG-7) is located at some distance from the guide (refer to Fig. 4-2).

Therefore, when performing section 4-6. No.7 Guide (TG-7) Adjustment it is convenient to use the alignment tape for tracking (Ref. No. J-5), modified as follows, and perform adjustment in playback mode.


Cut off
Cut off
Assemble

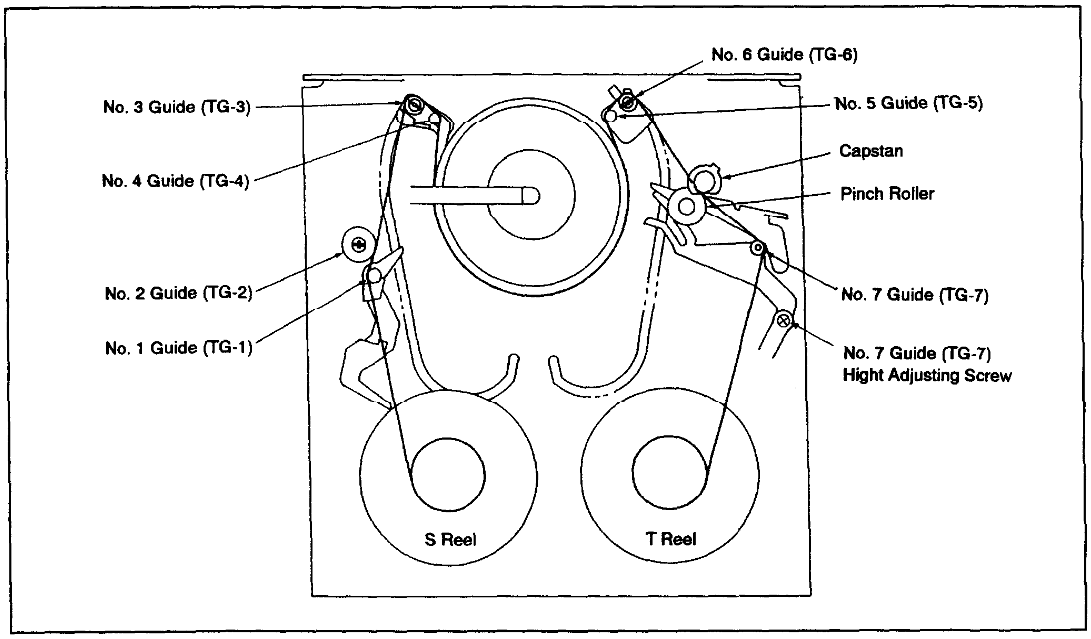

No. 6 Guide (TG-6)
No. 3 Guide (TG-3)
No. 5 Guide (TG-5)
Capstan
No. 4 Guide (TG-4)
Pinch Roller
No. 2 Guide (TG-2)
No. 7 Guide (TG-7)
No. 1 Guide (TG-1)
No. 7 Guide (TG-7)
Hight Adjusting Screw
S Reel
T Reel

Fig. 4-2.

4-2. PREPARATIONS FOR ADJUSTMENT

1) Clean tape path surfaces (tape guides, drum, capstan shaft, pinch roller) (See Fig. 4-2).
2) Connection of oscilloscope and output method of waveform.
CH 1: RF signal output of the drum head (V RF OUT)
Method for signal output:
Short-circuit the external trigger output (RF SW. P) and GND.

Example:
NTSC ····· GV-8
PAL ······· GV-8E
CH 1: Pin ③ (V RF OUT) of CN018 on the
{ SV-34 board (GV-8)
SV-35 board (GV-8E)
Method for signal output:
Short-circuit pin ① (GND) and pin ② (RF SW.P) of CN018 on the
{ SV-34 board (GV-8)
SV-35 board (GV-8E)
3) Play back the alignment tape for tracking adjustment (Ref. No. J-5).
4) Confirm that both the entrance and exit side RF waveforms of the oscilloscope are flat (See Fig. 4-4). If they are not, adjust as follows.

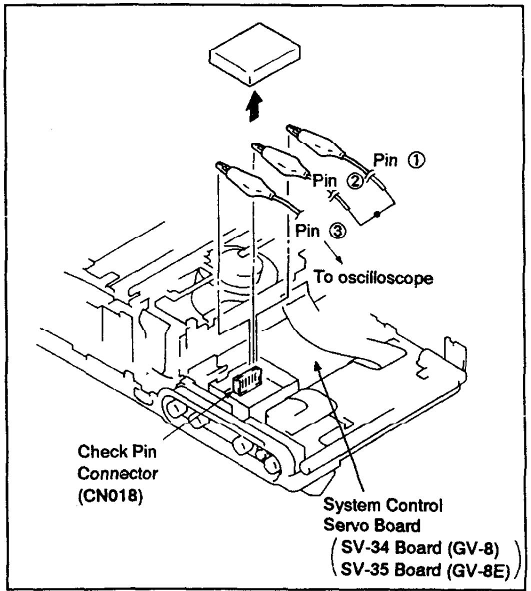

Pin ①
Pin ②
Pin ③
To oscilloscope
Check Pin Connector (CN018)
System Control Servo Board
(SV-34 Board (GV-8)
SV-35 Board (GV-8E))

Fig. 4-3.

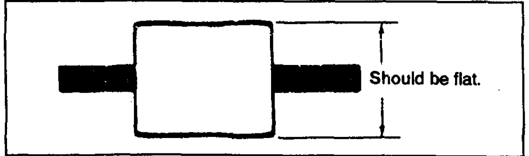

Should be flat.

Fig. 4-4.

4-3. TRACKING ADJUSTMENT (See Fig. 4-5.)

1) Play back the alignment tape for tracking adjustment.
2) Pass a hexagonal wrench, screwdriver (Ref. No. J-11) or the like through the hole ❶, loosen the lockscrew ❷ a little, then make the entrance side waveform flat by turning the No. 3 guide (TG-3) ❸.
3) Pass a hexagonal wrench, screwdriver or the like through the hole ❹, loosen the lockscrew ❺ a little, then make the exit side waveform flat by turning the No. 6 guide (TG-6) ❻.

Note: Take care not to loosen lockscrews too much, since guides come loose easily.

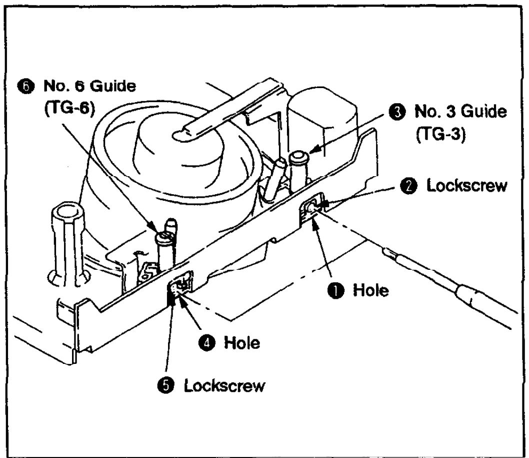

❻ No. 6 Guide (TG-6)
❸ No. 3 Guide (TG-3)
❷ Lockscrew
❶ Hole
❹ Hole
❺ Lockscrew

Fig. 4-5.

4-4. TRACKING FINE ADJUSTMENT (See Figs. 4-5. and 4-6.)

1) Play back the alignment tape for tracking adjustment and set the track shift mode.
2) Confirm whether the waveform is flat. If it is not, turn the No. 3 (TG-3) and No. 6 (TG-6) guides so that it becomes flat.
3) Fix the No. 3 guide ❸ by tightening its lockscrew ❷. Then confirm that the entrance side waveform has not changed.
4) Fix the No. 6 guide ❻ by tightening its lockscrew ❺. Then confirm that the exit side waveform has not changed.

Note: The set screws ❷ and ❺ should be tightened with a tightening torgue of approx. 200g•cm ± 10%.
If tightened too much, there is danger of damaging the thread.

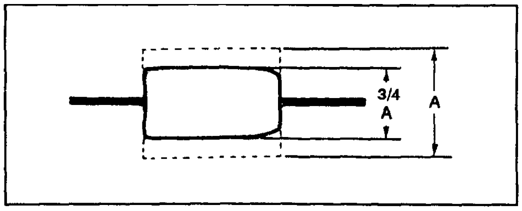


Fig. 4-6.

4-5. No. 2 GUIDE (TG-2) ADJUSTMENT

When the No. 2 guide has been turned or replaced, perform height presetting before this adjustment.

4-5-1. No. 2 Guide (TG-2) Height Presetting (See Fig. 4-7.)

1) Adjust the height from the mechanism chassis upper surface to the TG-2 upper flange ❶ upper surface to 18.6 mm by rotating the TG-2 upper flange ❶.

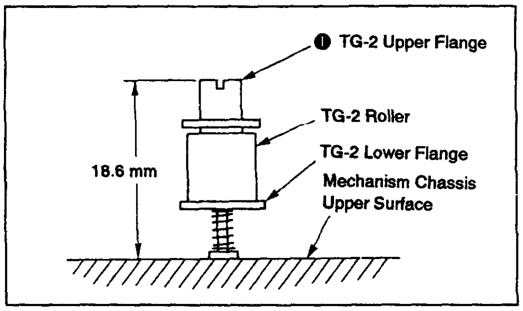


Fig. 4-7.

[Reference]

This U mechanism is equipped with four adjustable guides (TG-2, 3, 6 and 7). To raise or lower the respective guide rotate the corresponding adjustment screw as shown below.

Guide	Guide adjustment	Rotating direction of adjustment screw
TG-2, 3, 6	Raise	Counterclockwise
	Lower	Clockwise
TG-7	Raise	Counterclockwise
	Lower	Clockwise

4-5-2. No. 2 Guide (TG-2) Adjustment (See Figs. 4-8. and 4-9.)

1) Play back a thin tape like the P6-120MP, etc. and set the REV mode.
2) Confirm that the tape is not bent at the lower flange ❷ of the No. 2 guide (TG-2) ❶ (See Fig. 4-8). If it is, turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ clockwise with a screwdriver, lowering it until the tape is straightened.
3) Play back the alignment tape for tracking adjustment.
4) Perform tracking adjustment and tracking fine adjustment as described in sections 4-3. and 4-4.
5) In the track shift mode, CUE/REV the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds.
6) If the waveform is not normal (See Fig. 4-9), turn the upper flange ❸ of the No. 2 guide (TG-2) ❶ 90 ° counter-clockwise and repeat step 5.
   Repeat steps 5 and 6 until a normal waveform is obtained. Then, confirm that the tracking waveform has not changed. If it has, perform fine adjustment of entrance side tracking and repeat step 5.

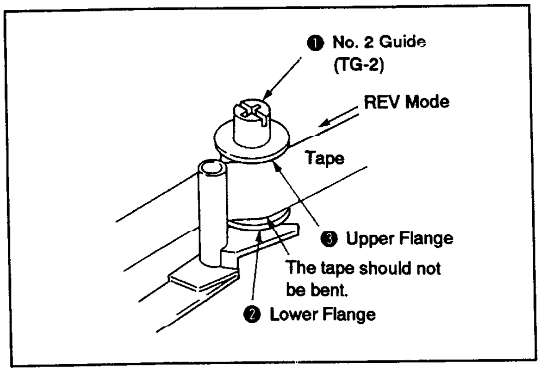

❶ No. 2 Guide (TG-2)
REV Mode
Tape
❸ Upper Flange
The tape should not be bent.
❷ Lower Flange

Fig. 4-8.

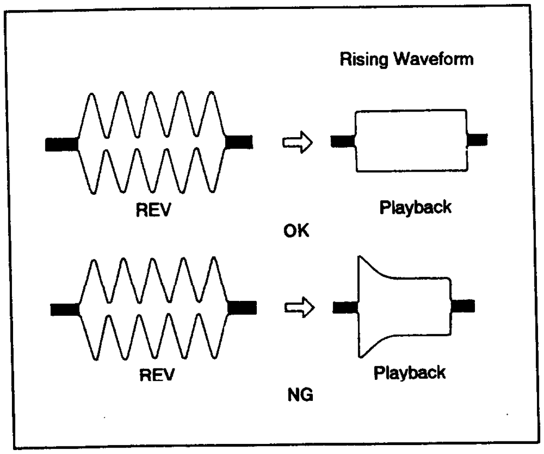

Rising Waveform
REV
OK
Playback
REV
NG
Playback

Fig. 4-9.

4-6. No. 7 GUIDE (TG-7) ADJUSTMENT (See Fig. 4-10.)

1) Play back the alignment tape for tracking adjustment and set the REV mode.
2) Confirm that the tape is not bent between the No. 6 guide (TG-6) ❶ and the capstan ❷ . If it is, turn the hight adjusting screw ❹ of the No. 7 guide (TG-7) ❸ until the tape is straightened.
3) Set the playback mode again and confirm that the tape is not bent between the capstan ❷ and the hight adjusting screw ❹ of the No. 7 guide (specification:0.5 mm or less) . If the tape is bent beyond the specification, turn the No. 7 guide (TG-7) ❸ until bending is within the specification (0.5 mm).
   If in the REV mode tape bending between the No. 6 guide (TG-6) ❶ and the capstan ❷ is 0.3 mm or less, adjustment can be considered completed.

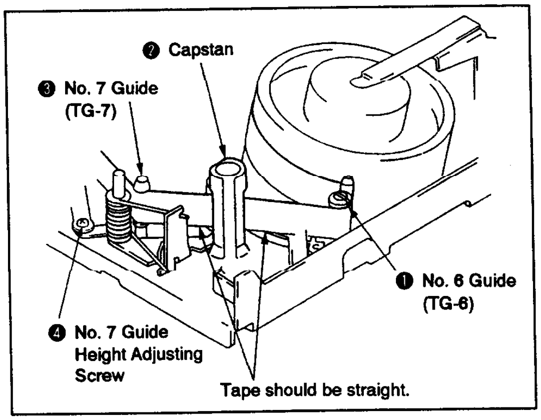

❷ Capstan
❸ No. 7 Guide (TG-7)
❶ No. 6 Guide (TG-6)
❹ No. 7 Guide Height Adjusting Screw
Tape should be straight.

Fig. 4-10.

4-7. CUE AND REV WAVEFORM CHECK (See Fig. 4-11.)

1) Play back the alignment tape for tracking adjustment and set the REV mode. Confirm that waveform peaks maintain a constant pitch of 5 seconds or more (See Fig. 4-11). In case pitch is not constant, perform section 4-4. Tracking Fine Adjustment and section 4-6. No. 7 Guide Adjustment.
2) Set the CUE mode. Confirm that waveform peaks still maintain a constant pitch of 5 seconds or more (See Fig. 4-11). Otherwise, perform section 4-4. Tracking Fine Adjustment.

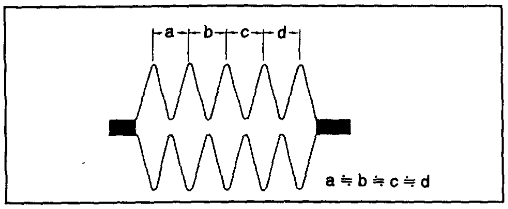


Fig. 4-11.

4-8. CHECK AFTER ADJUSTMENT

4-8-1. Tracking Check

1) Confirm that the amplitude of RF waveform is reduced to approx. 3/4 when the track shift mode is set (See Fig. 4-12).
2) Then, confirm that the minimum amplitude value (EMIN) is 65% of the maximum value (EMAX) or larger (See Fig. 4-13).
3) Confirm that no large fluctuations occur on the waveform (See Fig. 4-14).

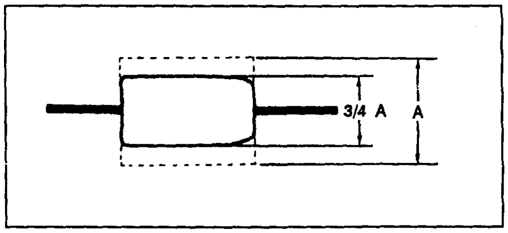


Fig. 4-12.

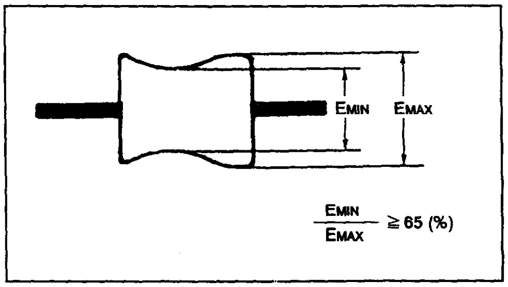


Fig. 4-13.

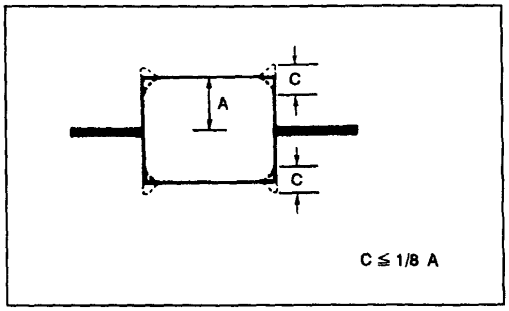
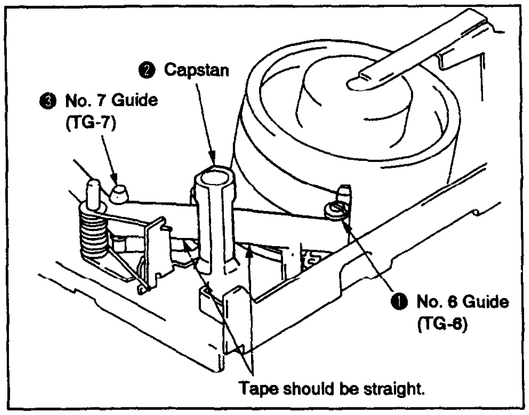


Fig. 4-14.

4-8-2. Rising Check (See Fig. 4-15.)

1) Play back the alignment tape for tracking adjustment.
2) Cancel the track shift mode.
3) Eject the tape, then load it again.
4) Set the playback mode and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller (See Fig. 4-15).
5) CUE/REV and FF/REW the tape, then play it back and confirm that the RF waveform rises flat within 2 seconds. Also confirm that the tape is not bent around the pinch roller.
6) Repeat steps 3) to 5) once more.


❷ Capstan
❸ No. 7 Guide (TG-7)
❶ No. 6 Guide (TG-6)

Tape should be straight.

Fig. 4-15.

4-8-3. Tape Path Check (See Fig. 4-16.)

1) Play back a thin tape like the P6-120MP (NTSC) or P5-90MP (PAL), etc. and confirm that no tape rising occurs, and that curling is less than 0.3 mm, at the lower flange of the No. 2 guide, the upper flange of the No. 3 guide, the upper flange of the No. 6 guide and the No. 7 guide upper and lower flanges.
2) Confirm that no tape rising occurs and that curling is less than 0.3 mm at the flanges of all guide when pressing the FF button in the playback mode to set the CUE mode, or the REW button to set the REV mode.

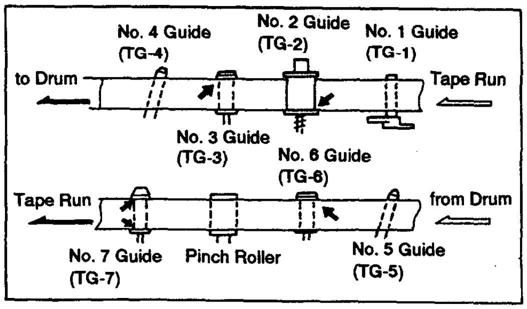

No. 4 Guide (TG-4)
No. 2 Guide (TG-2)
No. 1 Guide (TG-1)
to Drum
Tape Run
No. 3 Guide (TG-3)
No. 6 Guide (TG-6)
Tape Run
from Drum
No. 7 Guide (TG-7)
Pinch Roller
No. 5 Guide (TG-5)

Fig. 4-16.